

HOW TO KNOW the TREES

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HOW TO KNOW THE TREES



All illustrated key to the most common species of trees found east of the Rocky mountains, with suggestions and aids for their study.

by

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Professor of Biology
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Mt. Pleasant, Iowa

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The Pictured-Key Nature Series

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"Living Things—How to Know Them," Jaques, 1939
"How to Know the Trees," Jaques, 1940

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INTRODUCTION

TREES, of all of nature's creatures, are likely man's closest friends. They touch his life at every angle, and figure in most of his necessities and luxuries. To be able to meet and recognize them by name is a worthy achievement.

During the fall of 1928, a class in "Tree Study" at Iowa Wesleyan College undertook the making of a book of trees. An earlier class had counted the trees in Mt. Pleasant, and found that each of the almost four thousand inhabitants of the city possessed an average of four trees. More specifically, this tree census, which counted only the trees measuring at least four inches in trunk diameter, found a total of 15,998 trees growing in the city. The class collected specimens of these trees, studied and drew them and prepared the copy for the other parts of the book. They then transferred their drawing and copy to stencils. Under date of January, 1929, "The Trees of Mt. Pleasant", a mimeographed book of over 100 pages was published with "H. E. Jaques and Students" as authors. The little book found many friends and served for class and popular purposes until the edition was exhausted. The demand for it which outlived the supply has lead to the making of "How to Know the Trees".

It is an attempt to make tree identification as simple as possible, so that one need not be an experienced botanist to determine the name of some new tree. It covers the United States and Canada east of the Rocky Mountains except the extreme south. It should be borne in mind that not every species within these limits has been included. To make the book easier to handle, some species of infrequent occurrence or that are more often shrubs have been purposely omitted. Some of the more popular introduced species, which are commonly cultivated, have been included.

The natural distribution of our native species is shown graphically on the drawings. The height given for the trees are conservative maximum measurements.

Many have helped with the keys and in other ways. The drawings are largely the work of Arlene Knies, Martha Jaques Cutkomp, Mabel Jaques Cuthbert, and Francesca Jaques. Their patience and painstaking care have helped immensely. We want to thank all who have aided in any way.

Mt. Pleasant, Iowa
January 1, 1940



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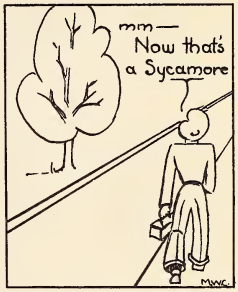


TREE HABITS AND FUNCTIONS



is the possessor of dull eyes or a flinty soul who does not feel a thrill when in the presence of a beautiful tree. This friendship with trees is age old and is one of man's finest experiences. To make the trees our friends we need to know them; and that is comparatively simple. Learn to recognize a new tree each day—or two each week—as you walk to work or back home. The distance will seem shorter and the threatened attack of dispepsia less imminent.

The pictured keys which start on page 17 should be sufficiently simple to enable any one who reads readily to determine the name of a strange tree. This chapter is designed however to further simplify the matter. A careful reading and an occasional reference to it may clear up some hazy ideas.



WHAT IS A TREE?

Trees are defined by the stuff they are made of and by their habits of growth and not, as one might suppose, by their size. In the unfriendly deserts and frigid areas, stunted little trees may struggle on for many years and never become a foot in height. In favored regions some robust species tower 350 feet or more above the ground and attain a trunk diameter of 30 feet. When freezing weather comes, some plants topple over in a sad mass while others continue to stand erect although they may lose their leaves. (Fig.1). The difference is in the walls of the cells which compose the stems. Some plants add quantities of lignin to their cell walls to thicken and stiffen them. Such stems are said to be woody and retain their position when dead. The others are known as herbs or herbaceous plants. All trees and shrubs have woody stems.

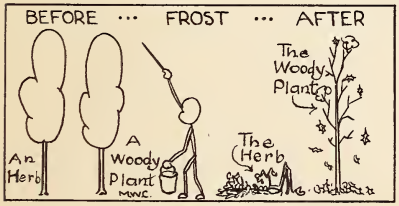


Figure 1
Jack Frost separates the herbs from woody plants.

A shrub has several stems arising from its root system while a tree has but one stem connecting its top with the roots. (Fig.2). The reader will recall plants taking both of these forms. Occasionally species, as some of the willows, hawthorns, and sumacs take both forms in their growth habit, and if one were making a complete list of trees and a second list of shrubs such species would need to appear in both lists.

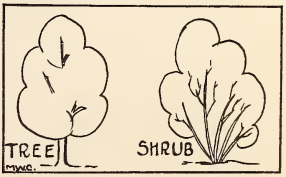


Figure 2

The plants of the world fall into four

great divisions or, as some botanists would say, into 15 phyla. With the exception of a few tree-like ferns all of the trees of the world belong to the highest of these 4 or 15 groups, the seed-bearing plants or Spermatophytes. Our definition grows. A tree is now seen to be a plant having but one woody stem arising from its rooty system and which at some time in its life bears flowers and seeds.

STARTING NEW TREES

There are several ways in which a tree may have its beginning. With the exception of a few varieties of mutants, all trees produce seeds. Under favorable conditions these seeds germinate, develop roots, stems and leaves, and "presto" we have a tree. The branches of some trees grow roots readily if put in water or damp soil. Nursery men raise their poplars, willows and some other trees by dividing twigs into small lengths with 2 or 3 buds and giving them good care until they take root. These are spoken of as cuttings. Scientific research has recently developed chemical solutions with which fresh cutting may be treated to greatly increase their tendency to form roots. This has added other groups of plants to the ones formerly started by the cheap and easy cutting method.

Under natural growing conditions as trees enlarge they must rid themselves of many branches that are no longer needed. Some trees develop brittle places in their twigs so that the wind or other natural causes readily break them from the tree. Trees so provided are said to have self pruning twigs. Out in nature freshly broken twigs of easily rooting species may float to new locations, become partly buried in the mud and grow into new trees.

Cultivated plants have all been brought in from a wild state originally, but many of them have been much changed by selection, mutation or crossing. New plants raised from the seeds of these changed cultivated forms are often not at all like their immediate parents but take the qualities of the wild ancestor; but cuttings produce new plants like their parents. In species where cuttings can not be made to grow, improvements would be lost if seeds were the only way to start new plants. Here is where grafting and budding come in. Cuttings (now known as scions) are taken from the favorite tree and inserted into the stem of a seedling or older tree where with proper care and favorable conditions, it forms a firm union and becomes an integral part of the tree. (Fig.3). Many tree buds are undeveloped branches. Such a bud may be so inserted under the bark of a young seedling that it will unite with it and grow to form a part of the tree. The remainder of the tree top may then be pruned away so that the root may represent the wild type and all above ground parts be like the improved plant from which the bud or scion came. The roots collect and deliver the food; the cells in the upper parts dictate the form and nature of the plant with its leaves, flowers and fruit. These roots of different

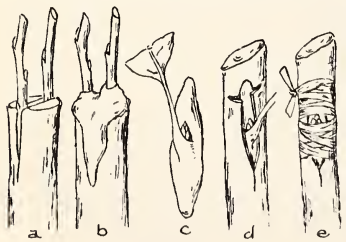


Figure 3
a, Cleft graft with two scions;
b, same graft after wax is applied;
c, bud cut for budding;
d, bud inserted in stock;
e, finished by tying with raffia.

kinds do not make any change in the flower or fruit produced on the grafted part any more than groceries brought by a colored delivery boy would endanger the fair skin of the grocery consumers.

TREE PARTS AND WHAT THEY DO

A tree has an underground root system and a main stem or trunk from which branches arise. These in turn produce leaves and eventually flowers, fruit, and seeds. (Fig.4.)

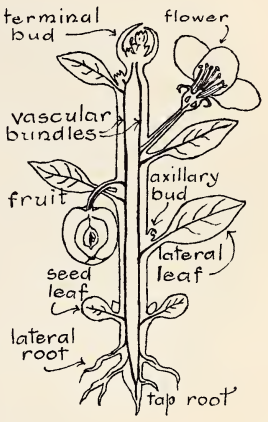


Figure 4
Diagram locating some essential parts of a tree.

The root system serves to hold the tree firmly in its place and to gather water and soluble chemical food materials from the soil. Water and the raw foods thus collected are delivered to the leaves and other growing parts of the tree through a well organized system of "pipe lines" which botanists call vascular bundles. Since the leaves are continually releasing large quantities of water vapor into the air, the roots have a most important task to secure sufficient water to maintain the needs of the leaves. Some trees like the walnuts depend largely on a main "tap" root which descends straight and deep into the ground. Others like the elms have a much-branched root system that spreads out under the surface of the ground. The root system of any healthy tree must balance the top. The tips of the roots under normal conditions usually extend out as far as the branches. When a tree is transplanted some of the roots are necessarily destroyed. Some of the top should then, with many species, be cut away to maintain a balance, and regular watering be given until a new root system can be grown. Trees with tap roots are more difficult to transplant successfully.

The main stem or trunk of a tree has two principal functions. It holds the crown of the tree erect where it can get air and sunlight and serves to transport water and other food materials between the roots and the crown. The trunk has a small central cylinder of pith. This is surrounded by a layer of wood then a layer of cambium tissue and finally on the outside, the bark. Fig.5 shows a diagram of these parts as they would be seen on the exposed end when a trunk or limb was sawed through. The cambium layer is where growth takes place. The cells composing it keep dividing and thus add new cells to the outside of the wood cylinder and other new cells to the inside of the bark. Each year a new layer of wood is added to the outside of the existing wood cylinder and a new layer of bark is intruded between the old bark and the cambium. It will be seen that while wood is always oldest at the center and young at the outside, the bark is just the reverse in being youngest at its inner side and old at the surface. This stretching of the bark tube to accommodate an ever enlarging wood cylinder results in the broken and flaky or furrowed appearance of tree trunks. Some of the damage is repaired by cork cambium cells within the bark layer which divide rapidly to form cork tissues. This tissue prevents loss of moisture through the trunk and other stems.

It should be understood that respiration is as necessary for plants as for animals. Leaves take in oxygen through their stomata but roots and stems must also have ready access to oxygen from the air. To put paving over the root system of a tree or to fill in around it, is usually disastrous. Stems have special pores in their bark for respiration. These openings known as lenticels show as prominent marks on many species and lend character to the twigs.

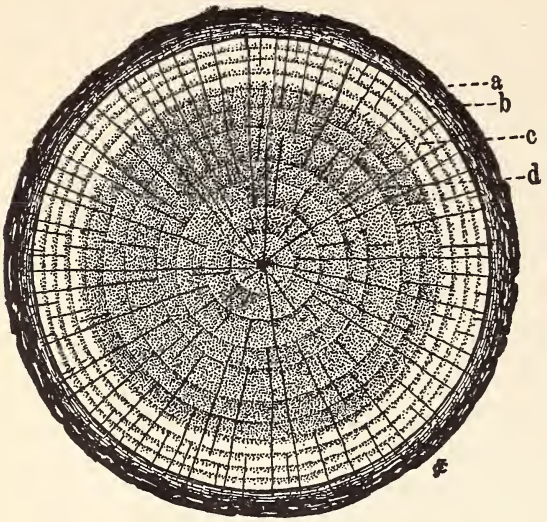


Figure 5
Cross section of a typical tree trunk, showing the various parts: a, Bark; b, cambium; c, sapwood; d, heartwood. The concentric rings in the sapwood and heartwood are the annual rings. The radial lines extending part way or entirely from the center to the bark are the pith rays. (U.S.D.A.)

The high activities of the trunk during the spring and early summer followed by the more deliberate growth of later summer and lack of growth during the cold months of our temperate region divides the wood into annual rings. Thus one can tell the age of a tree by counting the rings on the stump. The cross section shown in figure 5 is thus seen to be 11 years old. John Muir reported a "Big Tree" log among these California giants that seemed to have more than 4,000 rings. Bark shows rings in the same way as wood though not so plainly. The outer rings are usually sloughed off. Any disaster such as very late spring freezing or intensive insect damage that results in complete defoliation with the later appearance of a new set of leaves may make two rings in one year. This does not happen often, however. Variations in thickness of the annual rings reveal favorable and unfavorable years as well as other facts about the history of the tree.

Plates of tissue extending from the surface inward towards the center serve to bind the rings together and to serve for transfer of foods laterally in the stem. They are known as pith rays, medullary rays or wood rays. It is these that give the flaky appearance to quarter sawed oak. As the stem enlarges the hollow cells of the inner wood layers are filled with stored material often giving that part of the trunk a darker color. This is known as heart wood in contrast with the sapwood, the outer several rings which are still active in transporting liquids.

Organized food to be utilized in tree growth is transported through special tubes just outside the cambium. Roots as well as

all other parts of the tree are dependent on this food for growth. To girdle a tree by removing a ring of bark in through the cambium, cuts off the downward transfer of supplies and starves the roots. This plan is employed to kill trees that would otherwise throw up numerous sprouts from the roots and stump after being cut down.

Some trees have trunks which arise straight to the top of the cone shaped tree and have only minor lateral branches. Trees like this are said to be excurrent. (Fig.6). In the deliquescent type the trunk may divide into nearly equal parts or at least has some large lateral branches giving the tree a broad spreading crown.

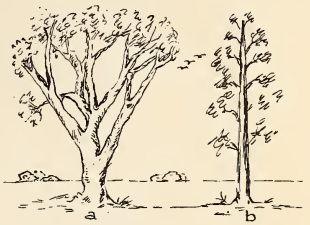


Figure 6
a, Deliquescent type;
b, Excurrent type.

TREE LEAVES

The leaves are perhaps the most important part of the tree. In them carbon dioxide from the air is combined with water from the ground to make carbohydrates,—the starches, sugars and such, from which the tree tissues are built. This work can be done only in green plant tissues and requires light as a motive power. It is the inner cells of the leaves that contain the green colored chlorophyll. A transparent layer of cells, the epidermis covers each side of the leaf. Light passed readily through the epidermis. The epidermis is punctured with many tiny openings through which the needed carbon dioxide may enter. In the process of food manufacture and growth, much free oxygen is released through these stomata into the air. This occurs only by day. Large quantities of water vapor is also being given off by the leaves. It has been shown that a good sized tree will release many gallons of water into the air during 24 hours. Many trees shed their leaves at the approach of winter or other periods when it would be difficult to replace the water given off by the leaves. It should be understood that this is a natural activity of the trees and that they are not necessarily killed by frost. These trees are deciduous in contrast to the evergreens which retain their leaves for two or more years and make some other adjustment to the transpiration loss of water.

On the tree stem just above the point of leaf attachment there is always a bud which may later grow into a lateral branch or flowers and fruit. (Fig.7). This axillary bud defines the leaf. Leaves often consist of an expanded blade which is supported on a stem-like petiole. The blade may have a smooth edge (entire) or be variously cut, notched, or lobed. Leaves are simple or compound according to whether the blade is in one part or more than one. If more than one the individual parts are known as leaflets. It will be observed that the leaflets do not have buds in the axils. Vascular bundles extend through the petioles and diffuse through the blade as veins. Since the types and shapes of leaves and their

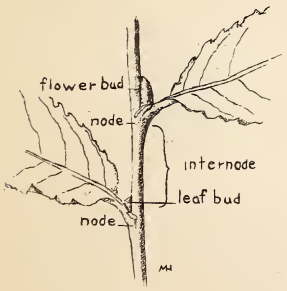


Figure 7
"An axillary bud defines a leaf."

veination is used in determining trees, self-explaining illustrations are here given. (Fig.8).

FLOWERS, FRUIT, AND SEEDS

All nature has two great urges—self protection and reproduction. The later is usually the stronger. Flowers, fruit, and seed are for reproduction. All of our trees bear flowers (though some botanists would not so distinguish the early stages of pine cones) from which the seeds and fruit develop. Stamens producing the pollen which in turn produces the sperm that fertilizes the eggs, represent the male part of the tree. The pistil is the part of the flower containing the ovules which produce the eggs. An egg when fertilized may develop into a seed. It represents the female part of the tree.

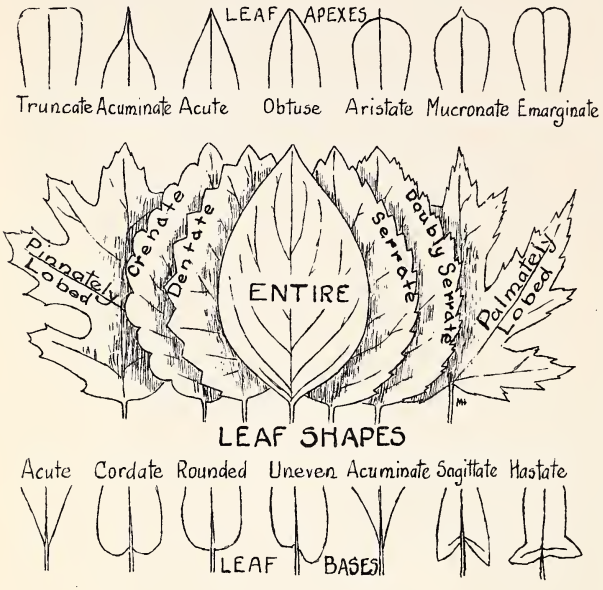


Figure 8

The petals and sepals are modified leaf-like parts that function for protection and display but are not essential to reproduction. Some flowers have both stamens and pistils. (Fig.9). They are bisexual and a tree bearing such flowers may be said to be both male and female. In some flowers only pistils or stamens, but not both appear. Again a tree may have both staminate and pistillate flowers; it is then said to be monoecious. It too, may be considered both male and female but in a different way. Finally some trees as the willows or box elder may have either pistillate flowers or staminate flowers but never both on the same individual tree. Such trees are said to be dioecious and are definately male or female. Such a pistillate tree must have a staminate tree of the same species growing in fairly close proximity to supply the pollen for pollination and fertilization if it is to

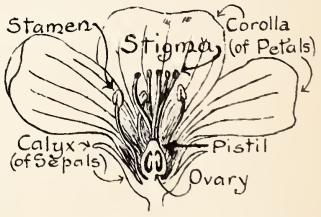


Figure 9
A complete flower has calyx, corolla, stamens and pistil.

mature seed. Flowers are born singly or in different types of groupings. For this also self-explaining pictures are given. (Fig.10).

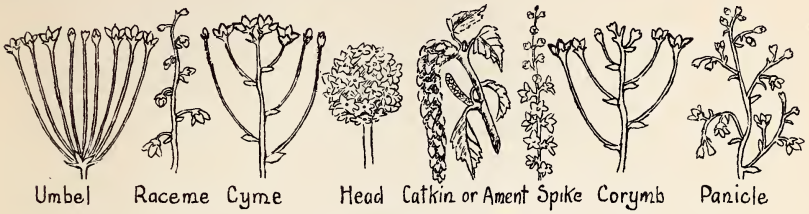


Figure 10
Inflorescense Types

After fertilization, the ovule develops into a seed which is a young tree with embryonic root, stem and leaves plus a sufficient store of food material to keep it growing until it can develop green leaves and begin manufacturing food for itself. Some seeds need to be planted soon after they ripen or they will die; others may be stored for several years and still germinate.

Except the Gymnosperms, tree seeds are contained within the pistil which has enlarged with their development. This is the "fruit" and may bear only one or many seeds and may be dry or fleshy. Flowers, fruit, and seeds are pictured for many of our trees in association with the keys.

ABOUT THE NAMES

For almost two hundred years each known plant and animal has had a scientific name, consisting of two words; a Latin noun, the genus, and following it a Latin adjective or noun in apposition. This latter is called the species name. The genus name always begins with a capital letter. Zoologists have agreed that the species name for animals should always begin with a small letter. Many botanists wish to do so with the plants. We are following that plan in this book. The abbreviation or word following is the name of the scientist who proposed the scientific name. It is known as the "author" or "authority" name. It is the plan that each plant should have the one same scientific name throughout the whole world but when nations quarrel and fight and even members of the same family do not wholly agree, it is little wonder that the botanists cannot always get together on the same name for some particular plant. Much time and care has been devoted to determining the correct names to be used for the trees herein described. Some will be shocked to find a pet name changed. The author discovers that he will need to relearn some tree names in order to use his own book.

There is really no plan for common names. They differ widely and the same name is often applied to several different plants which complicates things that much more. Instead of giving several common names the effort has been made to select one good and widely accepted one. We have tried to follow the best authorities in selecting both the common and the scientific names here used.

INSECTS AND TREES

All nature is inter-related in a most intricate maze. The ecologist attempts to untangle some of this. It seems timely to say a bit about insects in relation to the trees, as heavy loss is suffered by inroads of these pests. A good entomologist or tree specialist should be consulted when trees are endangered. Many fairly innocent native insects are so constantly associated with trees, however, that the tree lover could drive himself to the mad house if he took them very seriously. Over 800 species of insects have been listed that are known to live in relation to the oaks. Gall-making insects, leaf-miners and others are ever present but their actual damage is not ordinarily heavy. If one was grooming his trees to enter them at a state or international tree show, these annoyances would need to be corrected but for ordinary purposes, life will flow more serenely if one is not too much worried about these smaller sources of damage. We count on some broken windows and some scratches on the furniture if we raise children. Nature's creatures in like manner may be entitled to some lea-way.

TREE CENSUS AND ADDRESS BOOK

One of the most useful features in "The Trees of Mt. Pleasant", already referred to, was the fact that the street address of a representative specimen of each species of tree was given. One should have a mental picture of some good representative specimen of a tree species with which to compare the trees he studies. With this in mind, a space has been provided into which the location of typical specimens of trees in any region may be recorded. Students might well be required to fill in these blanks as a part of their study or a list of locations could be read to a class and the students permitted to enter these data in their books under each tree occurring in the region.

It will be noted that space is also provided for showing the number of trees of each species that may be found in a region. A census project is a highly valuable one when well handled. A class will learn much about tree identification by making a census count of the trees of the campus, school ground, park or other part of the city.



SOME TREE STUDY PROJECTS



better way can be found to learn to know and enjoy the trees than to go among them and to do something with them. Education may be so completely stripped of trouble that no one learns anything and no one cares. It requires time, energy, patience and preserverance, to make a collection of tree leaves and to mount them neatly and label them accurately but the student who does so gets much first hand information about trees and learns many other things besides.

A list of projects follows. The aggressive teacher or student will think of still other ways to work with trees. The public would be interested to know of the results of some of these problems or to see the collections.

1. Make a collection of tree seeds and mount and label them neatly. If the time of ripening were added to the label it would be valuable information.

2. Make a map of the school ground, park or other area, not too large, and locate and mark on it all the trees to be found, designating their species.

3. Set out new trees and encourage others to do so. A fine tree makes a noble monument to the one who planted it and may live for centuries.

4. Every school should have an area where many species of trees are planted. With some special care trees may often be grown with fair success in regions well out of their natural range. Such an arboretum whether large or small is helpful to the school as a place to study trees.

5. Let a class or individual students label the trees of the school ground or some other area with their common and scientific names.

6. "Spatter work" made by laying a leaf on card or paper and splashing or spraying ink over it, gives interesting leaf designs.

7. Secure seeds of native or distant trees and try germinating them and rearing the seedlings. (Fig.11).

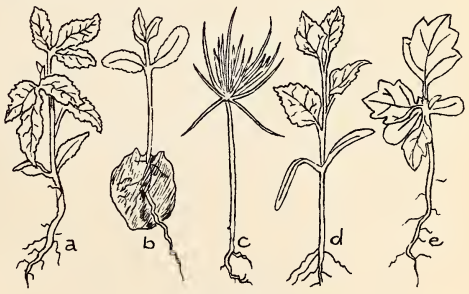


Figure 11
Tree Seedlings
a,b, Hop Tree;
c, Long-leaved Pine;
d, Green Ash;
e, Prairie Crab Apple.
(After C. M. King)

8. Make a study, with drawings, of tree seedlings in their different stages.

9. Make a collection of tree fruit. Study and make a chart showing the number of seeds per fruit.

10. A collection of tree twigs is always interesting and instructive. Use care not to damage trees when collecting twigs.

11. It is comparatively easy to do successful grafting or budding if one uses some care about it. Reliable directions are easily found. A tree bearing a dozen different varieties of apples or one bearing both cherries and plums never fails to excite interest.

12. When fall comes, look for the most beautifully colored leaves or trees. These should make fine subjects for color photography.

13. Determine the tallest tree, the one with widest spread of limbs and the one with the greatest trunk circumference at a given height, in some named region.

14. After having announced it in advance, have a "popularity contest" and take a vote to determine the most beautiful tree of some area.



15. Give your students some demonstrations in proper transplanting and pruning trees.

16. Visit trees that have been repaired by tree surgery or take a class to observe tree surgeons at work.

17. Try raising trees from cuttings. One of the plant hormone root stimulants might be tried, and cuttings treated with it compared with untreated ones.

18. A collection of wood is always of interest. Mounts that show cross sections, in contrast to both tangential and radial ones are particularly attractive.

19. Trees of almost every species have insect galls. Some galls are exceedingly interesting in their form and color. A collection can be made and kept permanently. (Fig.12).

20. A leaf collection has already been mentioned. Leaves may be mounted in a scrap book, on cards under cellophane or glass or between glass. Much is learned about trees in making the collection and it becomes valuable for reference or tests.



Figure 12
Some Gall of Oaks

21. Leaves may be inked on a stamp pad or with printer's ink spread thinly on glass and attractive prints made by pressing the inked leaf on card or paper.

22. Leaves may be used as a negative and printed on photographic paper.

23. Locate a good average specimen of each species of tree and mark the street number or other designation of the place it grows in the space provided in this book. That will make the book apply more closely to your region and increase its value.

24. Taking a tree census offers an excellent way to study trees. In counting the trees of Mt. Pleasant a street map of the city was secured and the town divided into areas bounded by the middle of streets. Two students were assigned to each area. Report form blanks were made and issued to the students on which they marked their count. If they could not be sure of the species of a tree, the teacher drove out with them to see it. When the work was finished and all blanks in, the results were tabulated. It was found that Mt. Pleasant with a population of less than 4,000 people had 15,998 trees 4 inches or more in trunk diameter and that Apple trees were most numerous of all with 3,369. Next in order came the American Elm, 2,137 and the Silver Maple, 1,846. In all a few more than 100 species of trees were represented.

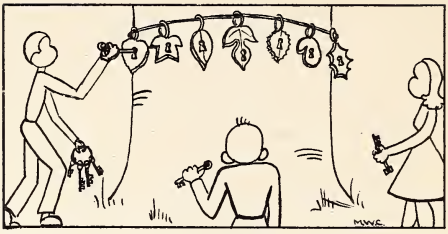
 At another time a class counted the trees in a near-by state park. Part of this area was rather dense woods and temporary markers were attached to the trees to locate the boundaries of the areas being counted. In this case species of dwarf habits were counted when 2 inches or more in size and larger ones of six inches. In this some 120 acres, 5,811 trees were counted. The most numerous species were the American Elm, 854; Iron Wood 804 and Sugar Maple 657.

25. If a leaf is left in water for an extended period, bacteria will consume the softer parts leaving only the tougher vascular tissue. One then has a "ghost leaf" showing the arrangement of veins. A collection made in this way would be highly valuable for studying different types of veination.

26. Drawing trees in their winter condition to show different types makes an interesting study. The key beginning at page 129 will help identify them.



HOW TO USE THE KEYS



It has been attempted to make the following tree keys just as simple and understandable as possible. Since pictures say so much more than words, drawings have been added wherever they would seem to make the meaning clearer. Some intelligence and considerable care will still be required to assure the largest success with them. It should be borne in mind when using any set of identification keys that they are merely aids and that they might not work out correctly in every case. Any characters mentioned should be applied only in the same relationship in which they are given.

These keys work by dividing the trees to be separated into two (or occasionally three) groups, each of which is again and again thus divided. As an example let us suppose we are standing around a tree on the campus. Each student has his book. We turn to page 17 and compare 1a, 1b and 1c. Our specimen plainly has "leaves with netted veined expanded blades", so we turn to page 36 where the Broadleafs are treated. It is plain that but one leaf appears at each node. 1a which fits this fact refers us to #2 and we compare 2a and 2b. Since the leaves are "simple" we go on and compare 3a with 3b. The fact that the leaves are pinnately veined sends us to 4a-4b where our attention is called to the uncut leaf margins agreeing with 4a. 5b agrees, as there are no thorns and we are referred to 7. Our specimen is like 7b in having no stipular rings and we are sent to #11. 11b guides us to 14 and we split a twig to look at the pith and find it has no diaphragms and is solid; in cross section the pith is seen to be star shaped all of which sends us to 16a and to the Oaks page 55.



When we examine the leaves we find a bristle at the tip. 43a points us to 44 and we shortly arrive at 45a and find our tree to be a Shingle Oak. To be sure that we have made no mistakes we compare it with the pictures and description and feel well satisfied with our determination. We then talk the tree over recalling the characters that helped in classification make other observations to fix a mental picture of the Shingle Oak in our mind, so that we will recognize the next one we see.

By referring to page 141 we find the oaks belong to the family Fagaceae. While there, we check the Shingle Oak for we plan to mark this list to show the trees we have determined.

PICTURED-KEY FOR THE IDENTIFICATION OF OUR MORE COMMON TREES



Figure 13

1a Leaves with netted veined, expanded blades. Dicotyledons. Fig.13. THE BROADLEAFS p.36



Figure 14

1b Leaves needle shaped, linear, awl-shaped or scale-like. Trees evergreen (except Larix and Toxodium). Gymnosperms. Fig.14. THE CONIFERS 2

1c Leaves fan shaped, veins equal in size and diverging from base of blade; borne on thick wart-like dwarf branches. Fig.15. MAIDENHAIR TREE Ginkgo biloba L.

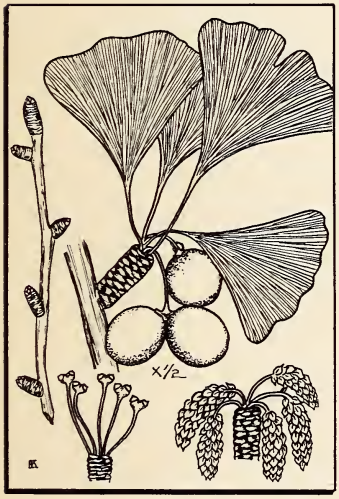


Figure 15

TREE: Sparingly branched; wood resinous; to 120 ft. high; native of China.

BARK: Light gray; outer bark shedding.

LEAVES: Fan shaped; alternate on thick dwarf branches.

FLOWERS: Dioecious, greenish, staminate in catkins; pistillate small; 2 ovules; pollen sacs arranged along slender spikes.

FRUIT: About 3/4 in. long, obovoid, yellowish with ill-smelling pulp surrounding whitish nut; kernel edible.

NUMBER:* In

USE: Cultivated, street and ornamental tree.

SPECIMEN:*

* For the "Tree Census and Address Book". See page 12.

THE CONIFERS



Figure 16

2a Leaves in definite clusters on the side of the branch. Fig.16 3



Figure 17

2b Leaves scattered singly on the stem; linear. Fig.17. 10

3a Clusters of 2 to 5 long needle shaped leaves. Retained for more than one year (evergreens). Fig.16a. THE PINES 20

3b Clusters of seven to many shorter needle-like leaves, borne on permanent wart-like dwarf branches. Leaves dropping each fall; trees bare during winter. Figs.16b,18 and 19. THE LARCHES 4

3c Not as in either 3a or 3b. 5

4a Cones 1/2 to 3/4 inches long; leaves one inch or less; native, growing in wet places. Fig.18. TAMARACK *Larix laricina* Koch.

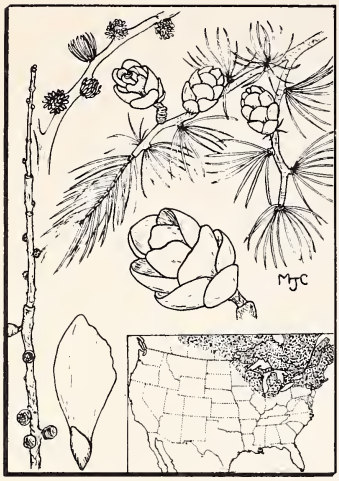


Figure 18

TREE: Slender excurrent type; to 100 ft. high. Wood hard and very strong. Intolerant of shade.

BARK: Close, slightly scaly, reddish-brown.

LEAVES: In tufts of many; 1/2 to 3/4 in. long; soft pale green; deciduous in winter.

FLOWERS: Monoecious; carpelate cones, red when young.

FRUIT: Cones 1/2 to 3/4 in. long; seed maturing first year; cones persisting for another year or two.

NUMBER: In

USE: Ship lumber, ties and poles.

SPECIMEN:

4b Cones 3/4 to 1½ inches long; leaves one inch or more; grows in dry ground; cultivated; from Europe. Fig.19, EUROPEAN LARCH *Larix decidua* Mill.

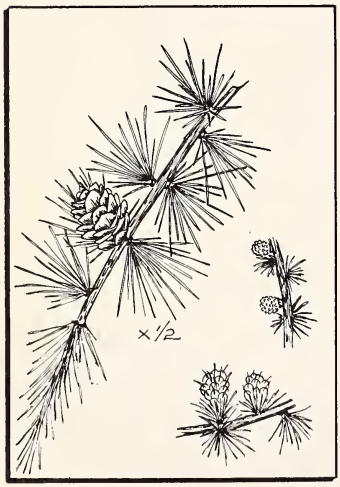


Figure 19

TREE: Tall pyramid shaped tree with horizontal branches bearing drooping branchlets. About 100 feet high.

BARK: Grayish brown; thin in rough loose flakes.

LEAVES: Wart-like dwarf branches bearing clusters of many deciduous needle-shaped leaves, 3/4-1½ in. long.

FLOWERS: Monoecious; staminate catkins developed in early spring; pistillate catkins, crimson or red.

FRUIT: Small cones 3/4 to 1½ in. long; seeds winged; maturing first season; cones persist 2 years or more.

NUMBER: In

USE: Ornamental, lumber, Venice turpentine.

SPECIMEN:

5a Leaves arranged feather-like as pictured, on deciduous dwarf branches. Trees bare during winter. Fig.20.

SOUTHERN CYPRESS Taxōdium distichum Rich.



Figure 20

TREE: With spreading crown, buttressed trunk and "knees"; to 12 ft. in diameter and 150 ft. high.

BARK: Reddish-brown, fibrous, flaky.

LEAVES: Feather-like, yellow-green, deciduous.

FLOWERS: Monoecious; staminate purplish in large clusters; pistillate borne singly, terminal.

FRUIT: Purple spherical cone, 1 in. in diameter; seeds winged, light brown.

NUMBER: In

USE: A most valuable lumber tree. Very durable. Planted for ornament.

SPECIMEN:

5b Not as in 5a. 6

6a Leaves scale-like, very small and tightly overlapping; less than 1/8 inch long. Fig.21. 7

6b Leaves awl-shaped, not closely overlapping; 1/4 to 3/4 inch long. Fruit a bluish berry-like cone. Figs.24 and 25 9

6c Leaves scale-like, appressed, 1/8 to 3/8 inch long; 4 ranked; nodes elongate; branches sometimes flattened. Fruit 3/4 to 1 inch, light red-brown. Fig.21.

INCENSE CEDAR Libocēdrus decurrens Torr.

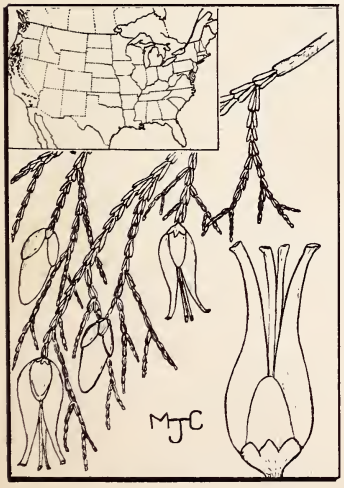


Figure 21

TREE: Excurrent type, to 150 ft. high.

BARK: Reddish-brown, thick shredded.

LEAVES: Yellowish-green; persisting from 3 to 5 years. Incense odor from resin gland on each leaf.

FLOWERS: Staminate, small, golden yellow; pistillate, terminal yellow-green.

FRUIT: Slender yellow-brown cones; 3/4 to 1½ in. long. Seed red-brown.

NUMBER: In

USE: Lumber; very durable.

SPECIMEN:

7a Young leafy shoots very much flattened and fan-like, in a horizontal plane; scale-like leaves 4 ranked.* Fig.22.
AMERICAN ARBORVITAE Thūja occidentālis L.

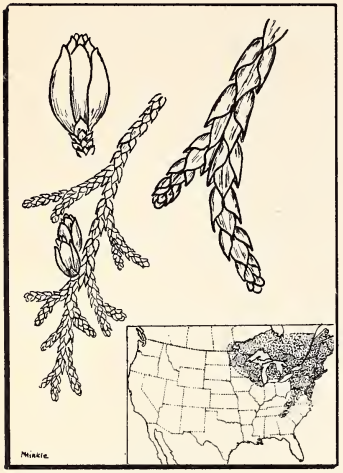


Figure 22

TREE: Has a wide based pyramidal head; to 65 ft. in height; usually small.

BARK: Rather smooth, and brownish in color, peeling in strips.

LEAVES: Small appressed, 4 ranked, on flattened fan-like twigs; yellow-green.

FLOWERS: Monoecious both staminate and pistillate cones very small; terminal.

FRUIT: Cones 1/2 in. long, with 6-10 scales. Seeds broadly winged all around.

NUMBER: In

USE: Wood light and durable, used for posts, railroad ties, etc. An important ornamental.

SPECIMEN:

* The CHINESE ARBORVITAE, Thūja orientālis L. is often planted. Its young leafy shoots usually stand in a vertical plane with both sides alike; the cones stand erect; the seeds have no wings.

7b Young shoots not conspicuously flattened. 8

8a Leaves scale-like, all nearly the same. Young shoots cylindric or but slightly flattened. Fruit a dry brownish cone. Fig.23. SOUTHERN WHITE CEDAR Chamaecȳparis thyoīdes BSP.

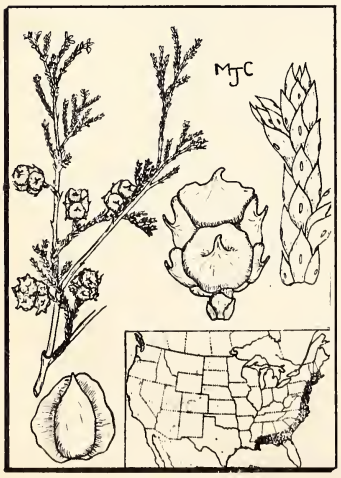


Figure 23

TREE: To 90 ft. in height. Shallow root system.

BARK: Reddish-brown; scaly.

LEAVES: Glaucous or light green, awl-shaped in opposite pairs; with conspicuous gland on back; some with keels.

FLOWERS: Small monoecious terminal cones.

FRUIT: Spherical blue cones about 1 and 1/3 in. in diameter; seeds winged.

NUMBER: In

USE: Woodenware, shingles, boat building.

SPECIMEN:

8b Leaves of two kinds,- many small and scale-like often forming a four angled shoot; others 1/4 to 3/8 in. long; awl-shaped and sharp pointed. Fruit a bluish-white berry-like cone. Fig.25.
EASTERN RED CEDAR See 9b

9a Leaves awl-shaped; all the same; whitened above and green below; usually three at each node. Fruit dark blue; axillary. Fig.24.
COMMON JUNIPER Juníperus communís L.

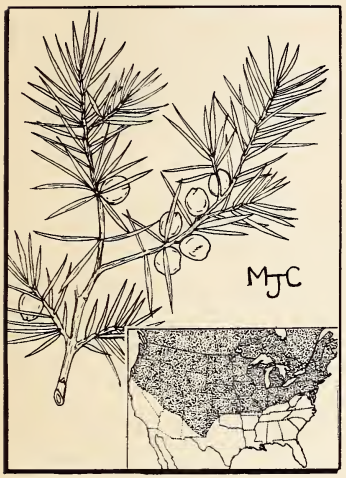


Figure 24

TREE: Low or erect shrub or tree, sometimes 30 ft. high. Branches spreading or drooping.

BARK: Shreddy, dark, resinous.

LEAVES: 1/4-1/2 in. long, often curved, rigid, sharp tips, lustrous dark green below, white above; in whorls of 3.

FLOWERS: Late spring, axillary; cone-like, small.

FRUIT: 1/4 in. in diameter, dark blue with bloom, sweet flesh. 1 to 3 bony seeds about 1/8 in. long, angled; maturing the 3rd year.

NUMBER: In

USE: In Europe used as fuel and ingredient in gin. In India used as incense.

SPECIMEN:

9b Leaves of two forms; one awl-shaped with two at each node; whitened above; the others, overlapping scales usually in 4 rows. Fruit pale blue, terminal. Fig.25.
EASTERN RED CEDAR Juníperus virginiāná L.

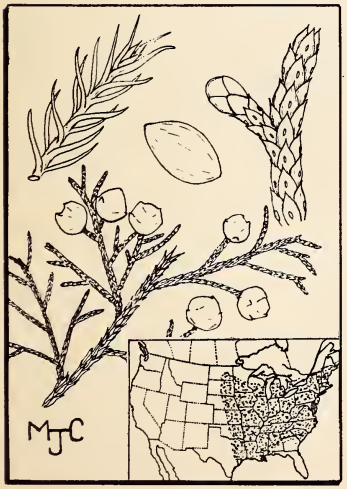


Figure 25

TREE: Evergreen, to 100 ft. high, trunk 2-3 ft. in diameter.

BARK: Fibrous, exfoliates lengthwise in strips, rather dark.

LEAVES: Two types; one scale-like, opposite, 1/16 in. long, in 4 sided branchlets, dark green; other, bluish green needles up to 1/3 in. long.

FLOWERS: Yellowish staminate cones 1/3 in. long; pistillate cones inconspicuous. Appear in early spring.

FRUIT: 1/4 in. in diameter, dark blue, glaucous bloom, at maturity; sweetish resinous flesh.

NUMBER: In

USE: Moth proof chests, woodenware, lead pencil coverings, telephone poles. Spreads apple rust through its cedar apples.

SPECIMEN:

10a Leaf bases remaining on the branches and roughening them. .11

10b Leaf bases dropping with leaves; stems comparatively smooth. 12

11a Leaves stalked, flattened and appearing two ranked. Fig.26. THE HEMLOCKS . . 15



Figure 26

11b Leaves sessile (without stalk); more or less 4-sided and spreading in all directions. Fig.27. THE SPRUCES 16



Figure 27

12a Leaves stalked, flattened; winter buds pointed; not resinous. Fig.28. DOUGLAS FIR Pseudotsuga taxifolia Britt.

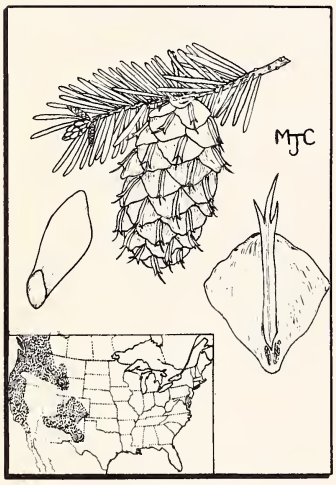


Figure 28

TREE: Slim excurrent type; to 200 ft. high.

BARK: Reddish-brown, broken into plates.

LEAVES: Soft, flattened, grooved above; 1 to 1½ in. long; persisting 5 to 8 years.

FLOWERS: Monoecious; staminate cones bright red; pistillate cones reddish, terminal.

FRUIT: Brown cone 1½–4½ in. long.

NUMBER: In

USE: Lumber; ornamental.

SPECIMEN:

12b Leaves sessile, flattened. Winter buds obtuse, resinous. Cones erect. Figs.29-31 13

THE FIRS: Genus ABIES

13a Leaves dark green and shiny above; cones purplish 14

13b Leaves pale blue or glaucous above; cones 3-5 inches long, often green or yellow, (occasionally purplish). Often cultivated. Fig.29. WHITE FIR Ábies cŏncolor L. and G.

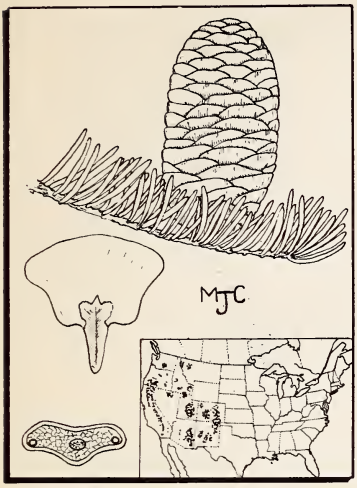


Figure 29

TREE: Conical to 200 ft. high.

BARK: Light gray; smooth when young; covered with resin blisters.

LEAVES: Flattened and whitish on both sides; blunt at tips; arranged spirally on stem; persisting 5 to 10 years.

FLOWERS: Monoecious. Staminate cones elongate, hanging from underside of lower limbs; pistillate cones small, and standing erect on upper branches.

FRUIT: Cylindrical cones, light olive green to purple, 3 to 5 in. long; erect.

NUMBER: In

USE: Ornamental tree; lumber.

SPECIMEN:

14a Bract of the cone much longer than the cone scales. Leaves mostly emarginate. Fig.30. FRASER FIR Ábies fráseri Poir.

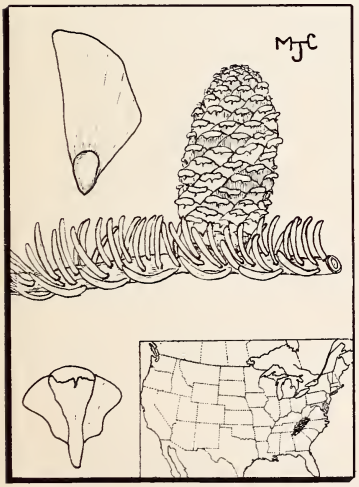


Figure 30

TREE: Excurrent type, to 70 ft. high. Grows only in dry soil.

BARK: Gray; smooth with resin blisters.

LEAVES: 1/2 to nearly 1 inch long, blunt at end, arranged spirally on the stem, whitish beneath.

FLOWERS: Monoecious; staminate cones, reddish-yellow; pistillate, yellow-green with scales broader than long.

FRUIT: Erect cones 2-3 in. high. Seed wide winged about 1/8 in. long.

NUMBER: In

USE: Balsam pillows. (Seen native in Smoky mountains.)

SPECIMEN:

14b Bract of the cone shorter than the cone scale, or occasionally slightly longer; acute. Fig.31.

BALSAM FIR Ā́bies balsā́mea Mill.

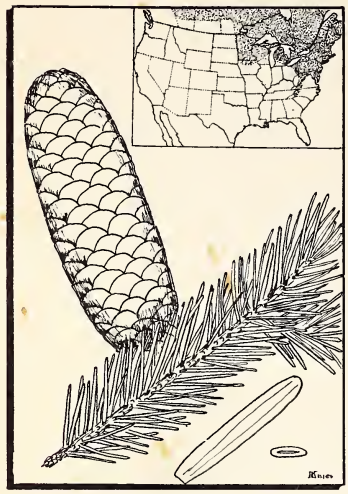


Figure 31

TREE: Handsome pyramid-shaped, narrow spire-shaped top, branches arranged in whorles; 50-75 ft. high.

BARK: Rich brown, smoothish with numerous resin warts.

LEAVES: Flattened; dark green above with 2 silvery stripes beneath, 1/2 to 1-1/4 in. long, rounded or pointed tips, fragrant.

FLOWERS: Monoecious; staminate, yellow, tinged with purplish red; pistillate, yellow-green. May.

FRUIT: Cones, 2-4 in. long, rounded at tip, generally bearing beads of free pitch. Stand erect.

NUMBER: In

USE: Ornamentation, balsam pillows, lumber, paper.

SPECIMEN:

15a Cones less than 1 inch long; their scales about as wide as long. Fig.32.

EASTERN HEMLOCK Tsūga canadĕ́nsis Carr.

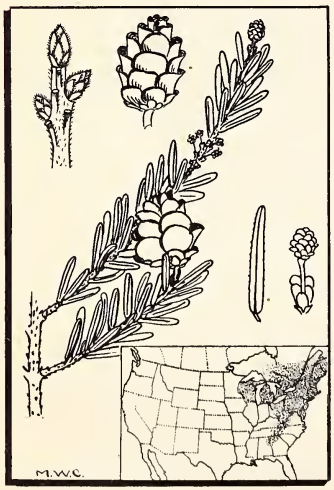


Figure 32

TREE: Tall, pyramid-shaped with slender horizontal or drooping branches; to 150 ft. high.

BARK: Reddish-brown or grayish, old bark flaky in scales.

LEAVES: Flat, 1/4-3/4 in. long, 1/16 in. wide, dark green above, light green with 2 silvery stripes beneath.

FLOWERS: Monoecious; staminate, light yellow; pistillate, pinkish-green. May.

FRUIT: Cones, brown, 1/2-1 in. long, seeds 1/16 in. long, wings, twice as long as seed.

NUMBER: In

USE: Ornamentation, lumber, pitch; bark used for tanning.

SPECIMEN:

15b Cones more than 1 inch long, their scales much longer than wide. Fig.33. CAROLINA HEMLOCK Tsūga carolinīana Engelm.

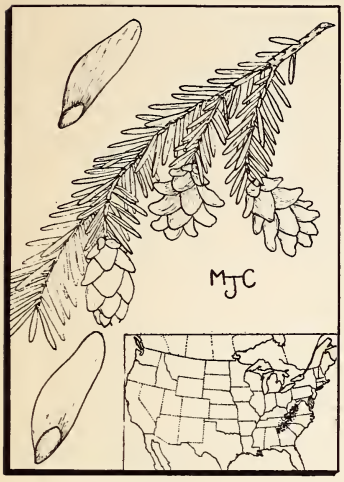


Figure 33

TREE: Compact, pyramidal, to 70 ft. high.

BARK: Dark, much furrowed in older trees.

LEAVES: Flattened 1/3 to 3/4 in. long with rows of whitish stomata below; shining, dark green above.

FLOWERS: Purplish; monoecious.

FRUIT: Brown cones 1 to 1½ in. long. Seeds with large wing; about 1/6 in. long.

NUMBER: In

USE: Ornamental planting. A rare tree. Wood like that of Eastern Hemlock.

SPECIMEN:

THE SPRUCES: Genus PĪCEA

16a Twigs pubescent brown; cone-scales stiff and rigid at maturity. Cones less than 2 inches long, oval. 17

16b Twigs glabrous; cones cylindric 18

17a Leaves blue-green, covered with whitish bloom; cones persisting for several years. Fig.34. BLACK SPRUCE Pīcea mariāna BSPK.

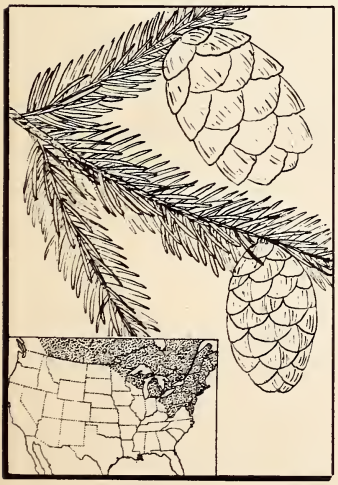


Figure 34

TREE: Excurrent type; slender; to 90 ft. high.

BARK: Dark brown, flaky.

LEAVES: Stiff, 1/4 to 1/2 in. long, often curved. Bluish-green.

FLOWERS: Monoecious; staminate with reddish anthers.

FRUIT: Brown cones 3/4-1½ in. long; remaining on tree for two or three years.

NUMBER: In

USE: Lumber and paper. One of the common commerical Christmas trees.

SPECIMEN:

17b Leaves yellow-green without whitish bloom; cones falling at end of first season. Fig.35. RED SPRUCE Picea rubra Link.

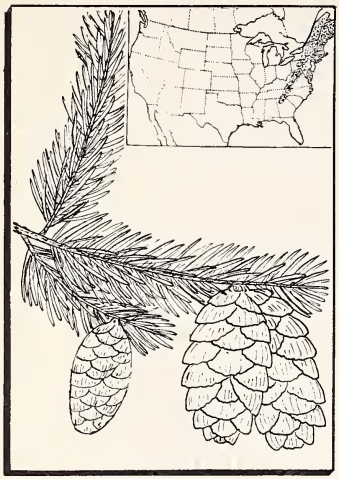


Figure 35

TREE: Tall, slender, wide open pyramid top, horizontal branches, straggly appearance.

BARK: Reddish brown, nearly smooth.

LEAVES: 1/2-3/4 in. long, incurving, dark dingy green. Scattered around stem.

FLOWERS: Staminate flowers oblong cylindrical, pistillate flowers oblong. May.

FRUIT: Cones, 1-1/4 - 2 in. long, falling in fall or early winter. Seeds 1/8 in. long, wing broad at base.

NUMBER: In

USE: Ornamentation, paper pulp, lumber, spruce gum.

SPECIMEN:

18a Leaves 3/4 to 1½ inches long. 19

18b Leaves 1/2 to 3/4 in. long. Highly glaucous. Cones 1 to 2 in. long; scales rounded, not ragged. Fig.36.
WHITE SPRUCE Picea canadensis BSP.

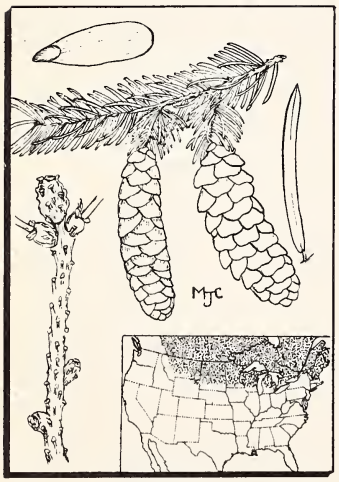


Figure 36

TREE: Slender symmetrical, to 100 ft. high.

BARK: Reddish brown; irregularly scaled and roughened.

LEAVES: Glaucous green, 1/3-1 in. long, incurved.

FLOWERS: Monoecious; staminate reddish yellow; pistillate reddish green.

FRUIT: Cylindrical cones 1-1½ in. long.

NUMBER: In

USE: Paper pulp, lumber, windbreaks, ornamental planting.

SPECIMEN:

19a Leaves green. Cones 3 to 7 inches long. Cone scales rounded at tip. Fig.37.

NORWAY SPRUCE Pĭcea ăbies Karst.

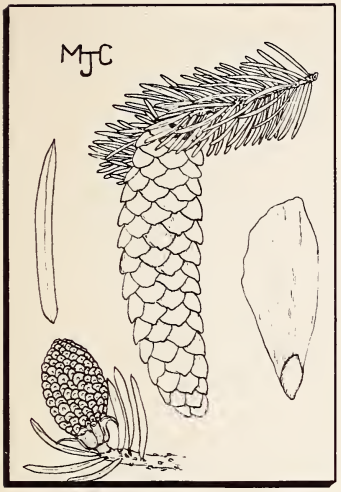


Figure 37

TREE: Large, conical tree with drooping branches; to 80 ft. high. Introduced from Europe.

BARK: Thin and scaly; reddish brown.

LEAVES: Yellow-green, linear, 4-sided, arranged spirally on limbs; 3/4 to 1 in. long.

FLOWERS: Monoecious; terminal or in axils of upper leaves. Cone-like.

FRUIT: Cones 4 to 7 in. long. Appearing in upper part of tree.

NUMBER: In

USE: Abundant as cultivated shade tree, and for wind-breaks. Also a source of Burgundy pitch. Valuable for lumber.

SPECIMEN:

19b Leaves bluish green or silvery. Cones 2½ to 4 in. long. Cone scales acute and ragged at tip. Fig.38.

COLORADO BLUE SPRUCE Pĭcea pŭngens Englm.



Figure 38

TREE: Branches horizontal, arranged in whorls, decreasing regularly in length from below upward. 80 to 120 ft. high.

BARK: Gray sometimes tinged with cinnamon-red, with plate-like scales.

LEAVES: Rigid, 4-sided, strongly incurved, pointed, bluish-green to silvery or dull green. 1/2 to 1-1/4 in. long.

FLOWERS: Staminate, reddish-yellow; pistillate, pale green.

FRUIT: Cones, produced on upper 1/3 of tree, 2½ to 4 in. long.

NUMBER: In

USE: Ornamentation, lumber, spruce gum, paper pulp. Kosters Blue Spruce is an improved variety and is propogated by grafting.

SPECIMEN:

THE PINES: Genus PĪNUS

20a Leaves in clusters of 5 21

20b Leaves in clusters of less than 5 22

21a Cones long stalked, their scales thin. Leaves blue-green, 3 to 5 in. long. Fig.39. NORTHERN WHITE PINE Pīnus strōbus L.

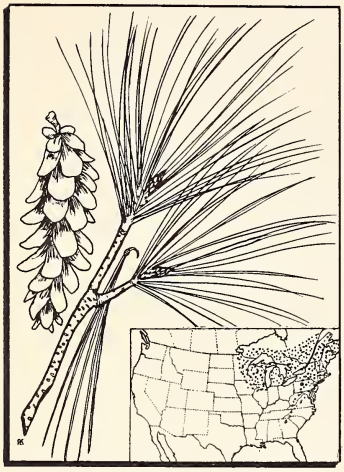


Figure 39

TREE: Attains height of 150 ft. Branches arranged horizontally in regular whorls.

BARK: On small trees smooth, greenish gray. On older trees dark and deeply ridged.

LEAVES: Needle-like. Arranged in bundles of 5. Bluish-green, 2 to 5 in. long.

FLOWERS: Monoecious; staminate, yellow; pistillate, purplish.

FRUIT: Cones, cylindric, slender, 4 to 8 in. long. Seeds winged.

NUMBER: In

USE: Once America's most valuable lumber tree; ornamental.

SPECIMEN:

21b Cones short stalked, their scales thick at tip. Leaves rigid, dark green, 1½ to 3 in. long. Fig.40. LIMBER PINE Pīnus flĕxilis James

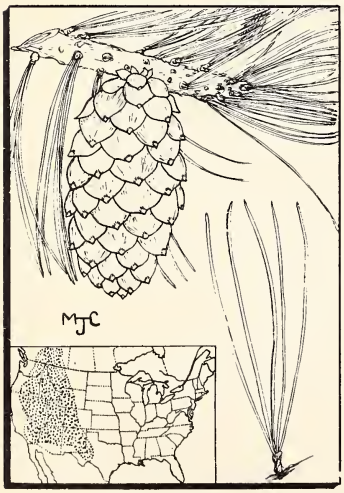


Figure 40

TREE: Open, spreading short trunk, to 80 ft. high.

BARK: Thick, dark brown.

LEAVES: 1½ to 3 in. long, in bundles of 5; dark green, retained for 5 or 6 years.

FLOWERS: Male, reddish; female, bright red-purple.

FRUIT: Green or purplish cone, 3 to 9 in. long.

NUMBER: In

USE: Lumber

SPECIMEN:

22a Leaves most often in clusters of 3. (Sometimes 5 in ponderosa and 2 in caribaea) 23

22b Leaves most often in clusters of 2 (sometimes 3 in echinata). 26

23a Cones sub-terminal 24

23b Cones lateral. 25

24a Buds brown. Leaves 8 to 11 in. long. Cones 3 to 6 in. long. Fig.41. PONDEROSA PINE Pīnus ponderōsa Laws.

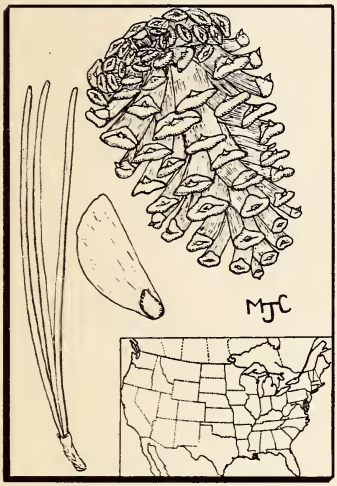


Figure 41

TREE: Stately slender to 200 ft. high, and 5 to 8 ft. in diameter.

BARK: Reddish brown, scaly.

LEAVES: 3 to 6 in. long in groups of 3 or sometimes 2.

FLOWERS: Monoecious; male, yellow; female, dark red, in clusters or pairs.

FRUIT: Cones, 3 to 6 in. long, standing erect until ripening then hanging.

NUMBER: In

USE: Often planted for ornament. A highly valuable lumber tree.

SPECIMEN:

24b Buds white; leaves 8 to 18 in. long; cones 6 to 10 in. long. Fig.42. LONGLEAF PINE Pīnus australīis Michx.

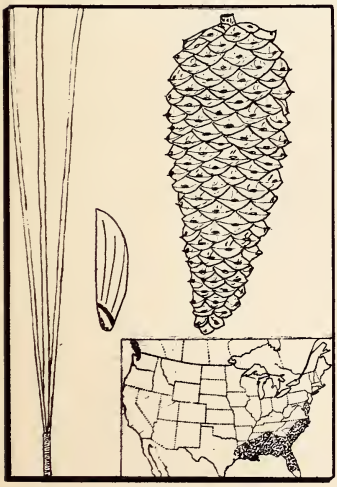


Figure 42

TREE: Slender, sparingly branched open; to 150 ft. high.

BARK: Papery scales; orange-brown.

LEAVES: In bundles of 3; 8 to 18 in. long.

FLOWERS: Male, yellow; female, dark red.

FRUIT: Reddish-brown cones 5 to 10 in. long.

NUMBER: In

USE: Lumber, resin, turpentine.

SPECIMEN:

25a Leaves 8 to 12 in. long, in clusters of 2 and 3. Cones 2 to 6 in. long, with short stalks. Fig.43.
SLASH PINE Pīnus caribaēa Morel.

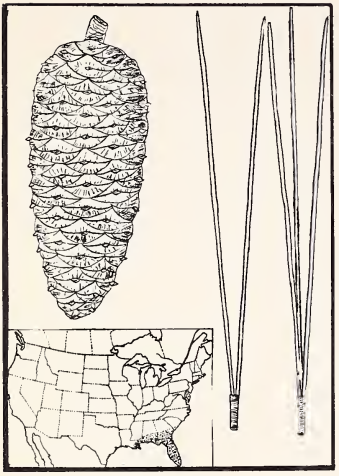


Figure 43

TREE: Rather broad, open top to 150 ft. high. Grows rapidly and matures early.

BARK: In loose plates; orange colored.

LEAVES: In bundles of 2, 3 or more. Shiny, dark green, 8 to 12 in. long.

FLOWERS: Male, dark purple; female, pink. January and February.

FRUIT: Cone, 3 to 6 in. long. Seeds winged triangular, brown.

NUMBER: In

USE: Lumber, ties, turpentine gums, wood pulp and fuel.

SPECIMEN:

25b Leaves 6 to 9 in. long. Cones 2 to 6 in. long, sessile. Fig.44.
LOBOLLY PINE Pīnus taēdá L.

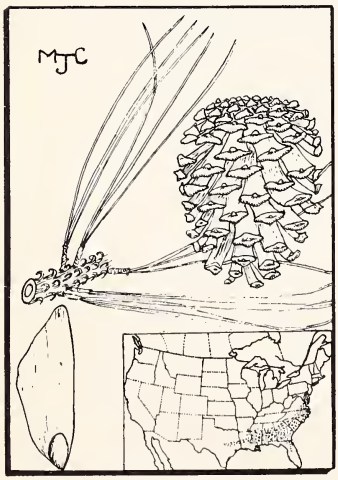


Figure 44

TREE: With spreading open top to 125 ft. Rather short lived as pines go.

BARK: Reddish-brown; scaly plates.

LEAVES: 6 to 9 in. long; pale green with tinges of glaucous; dropping third year.

FLOWERS: Male cones, yellow; female, yellow. March to early May.

FRUIT: Reddish-brown; 3 to 6 in. long; each scale with sharp tooth.

NUMBER: In

USE: Lumber, though coarse grained and rather inferior.

SPECIMEN:

25c Leaves 3 to 5 in. long. Cones 1 to 3½ in. long, sessile. Fig.45.
PITCH PINE Pinus rigida Mill.

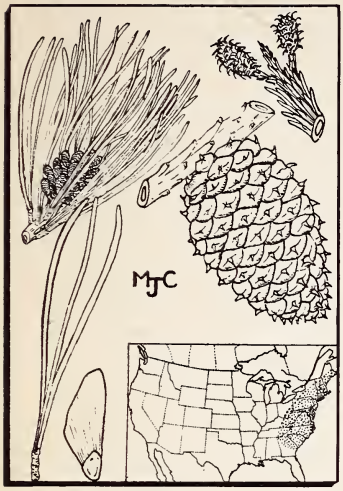


Figure 45

TREE: Often wide topped, deliquescent type to 100 ft. high.

BARK: Reddish-brown, deeply furrowed.

LEAVES: Yellowish-green, stiff, sharp pointed; in bundles of 3. Falling after 2 years.

FLOWERS: Male cones, usually yellow; female, light green tinged with red.

FRUIT: Ovoid cones, 1 to 3 in. long. Seeds triangular.

NUMBER: In

USE: Props, fuel, ties, pulp, landscaping.

SPECIMEN:

26a Cones terminal or subterminal 2 to 2½ in. long, their scales without prickle. Leaves 5 to 6 in. long. Fig.46.
RED PINE Pinus resinosa Ait.

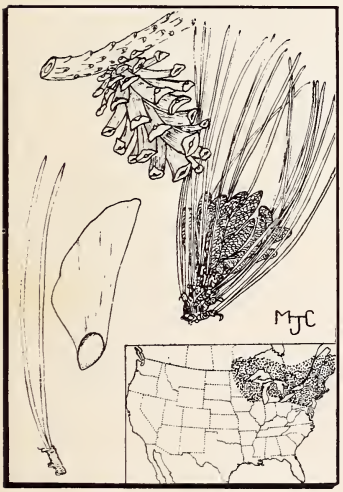


Figure 46

TREE: Sturdy with conical crown to 125 ft. high.

BARK: Reddish-brown, irregularly flaked.

LEAVES: Glossy dark green, in bundles of 2; 4 to 6 in. long; retained 4 or 5 years.

FLOWERS: Male, dark purple; female, scarlet.

FRUIT: Smooth cones about 2 in. long; maturing second year.

NUMBER: In

USE: Piles, ship building and general construction. Bark for tanning.

SPECIMEN:

26b Cones lateral (on side of twig) 27

27a Cones symmetrical 28

27b Cones incurved; leaves less than 2 in. long. Fig.47.
JACK PINE Pinus banksiana Lam.

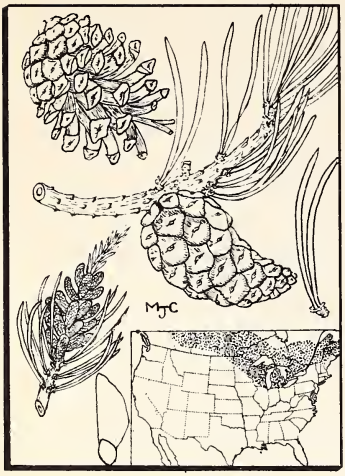


Figure 47

TREE: With open head; to 70 ft. high. Intolerant to shade.

BARK: Thin, dark brown.

LEAVES: Yellow-green, later dark green; about one in. long.

FLOWERS: Male, in loose clusters, yellow; female, dark purple.

FRUIT: Slender cones, strongly incurved; often unopened for years.

NUMBER: In

USE: Fuel, ties, lumber, posts.

SPECIMEN:

28a Leaves less than 3 in. long 29

28b Leaves 3 in. or over in length. 31

29a Bark of medium sized limbs, orange-brown. Leaves 1½ to 2½ in. long, grayish-green. Fig.48. SCOTCH PINE Pinus silvestris L.

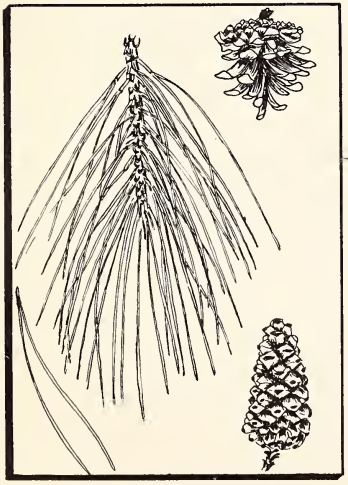


Figure 48.

TREE: Trunk rarely straight; with open scraggly tops; long-lived; to 100 ft. high.

BARK: Smooth, becoming fissured at base. The orange red color of upper branches readily distinguishes it from other pines.

LEAVES: Needle-like in fascicles of two, 1 to 3½ in. long, dark green.

FLOWERS: Monoecious. Cones in early spring. Male, yellow; female, green.

FRUIT: Cones 1 to 2½ in. long with thickened rhombic scales with central tubercle. Ripening in two years.

NUMBER: In

USE: Ornamental in pyramidal and dwarf forms; lumber.

SPECIMEN:

29b Bark of medium sized limbs, grayish-brown 30

30a Leaves stout gray-green, 1½ to 2½ in. long; buds very resinous. Native. Fig.49. SCRUB PINE Pīnus virginiāna Mill.



Figure 49

TREE: With drooping branches; to 100 ft. high.

BARK: Dark brown tinged with red.

LEAVES: Gray-green; 1½ to 3 in. long, lasting 3 or 4 years.

FLOWERS: Male, orange-brown; female, pale green tinged with red.

FRUIT: Reddish-brown cones with prickles on scales.

NUMBER: In

USE: Fuel and occasionally for lumber; coarse and rather low quality.

SPECIMEN:

30b Leaves stiff and twisted bright green; 1 to 3 in. long. Cultivated often as a shrub or small globular tree. Fig. 50. SWISS MOUNTAIN PINE Pīnus mūgo Turra



Figure 50

TREE: Shrub or pyramidal tree to 40 ft. Spherical forms common in cultivation.

BARK: Gray.

LEAVES: Bright green 1 to 3 in. long; in groups of 2.

FLOWERS: Male cones, yellow; female, greenish.

FRUIT: Gray, 3/4 to 2½ in. long.

NUMBER: In

USE: Ornamental

SPECIMEN:

31a Cultivated. Cone scales without spine. Fig.51.
AUSTRIAN PINE Pinus laricio austriaca Endl.

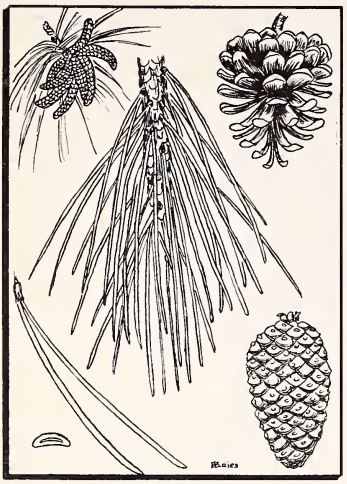


Figure 51

TREE: Tall, open, pyramidal, rapid-growing with branches in regular whorls; to 100 ft. high. Twigs few and thick.

BARK: Broad ridged, dark gray.

LEAVES: 3 to 5 in. long, heavy, dark green; in long sheaths of 2.

FLOWERS: Male cones, yellow; female, green.

FRUIT: Cones 2 to 3 in. long, often in pairs. Seeds rather large with broad wings. Ripening in 2 years.

NUMBER: In

USE: Fuel and ornamentation.

SPECIMEN:

31b Native. Cone scales armed with spine 32

32a With stout spine at tip of cone scale. Cones 3 to 5 in. long. Fig.52. MOUNTAIN PINE Pinus pungens Lamb.

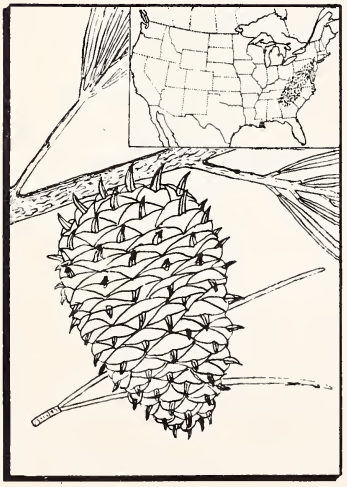


Figure 52

TREE: With spreading branches; to 60 ft. high.

BARK: Rough and flaky; dark brown tinged with red.

LEAVES: 1½ to 2½ in. long; dark bluish-green, falling after 2 or 3 years.

FLOWERS: Male cones, yellow; female, green.

FRUIT: Several cones in a cluster; 2 to 3½ in. long; each scale with sturdy spine.

NUMBER: In

USE: Fuel and charcoal.

SPECIMEN:

32b With only a small prickle at tip of cone scale. Cones 1½ to 2½ in. long. Leaves 2 to 5 in. long. Fig.53.
SHORTLEAF PINE Pinus echinata Mill.

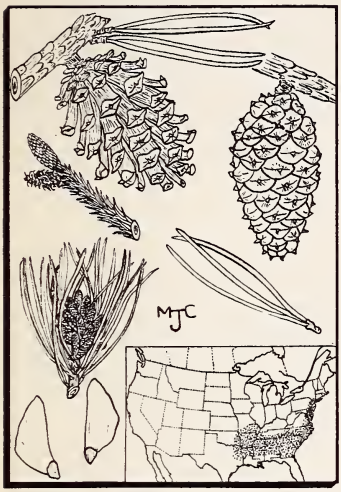


Figure 53

TREE: With open crown; to 120 ft. high. Sprouts from the stump when cut or damaged.

BARK: Rather thick; irregularly furrowed; reddish-brown.

LEAVES: 3 to 5 in. long; dark blue-green; fall after 2 or 3 years.

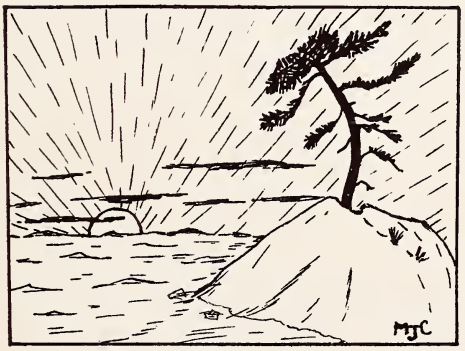
FLOWERS: Male cones, light purple; female, pale rose.

FRUIT: Cones brown; 1½ to 2½ in. long.

NUMBER: In

USE: Lumber. Ornamental or shade tree.

SPECIMEN:



PICTURED-KEY TO THE MORE COMMON BROADLEAF TREES

1a Leaves alternate (only one at each node). Fig.54 2



Figure 54

1b Leaves opposite (two at each node) or whorled (three or more at each node). Fig.55. 149



Figure 55

2a Leaves simple. Fig.56a . . .3

2b Leaves compound. Fig.56b .122



Figure 56

3a Leaves with pinnate veins (principal veins arising along the mid rib) or with only a mid rib. Fig.57 4



Figure 57

3b Leaves with at least three heavy veins (mid rib counts as one) arising at the base of the blade (palmately veined). Fig.58. 108

4a Leaves entire (margin not cut). Fig.58a. 5



Figure 58

4b Leaves with margins cut, notched or lobed. Fig.59 22



Figure 59

5a Branches with thorns; sap milky 6

5b Without thorns; sap not milky 7

6a Thorns terminal and sometimes axillary. Leaves tapering at base. Fig.60. WOOLLY BUCKTHORN Bumēlia lanuginōsa Pers.



Figure 60

TREE: Shrub or tree to 60 ft. high.

BARK: Thick, deeply fissured; brown tinged with red.

LEAVES: Narrowed at base, rounded at tip; shiny, dark green above; rusty brown or silvery white hair below. Shed tardily during winter.

FLOWERS: Minute, greenish-white; in axillary umbels.

FRUIT: An oval berry about 1/3 in. long; black when ripe.

NUMBER: In

USE: Ornamental.

SPECIMEN:

6b Thorns at side of axillary buds. Leaves not tapering at base. Fruit a greenish ball, 2 in. or more in diameter. Fig.61. OSAGE-ORANGE Maclūra pomifera Sch.



Figure 61

TREE: Rather small with stout thorns 1/2 to 3/4 in. long. To 60 ft. high when growing in forest.

BARK: Orange-brown, pealing into strips.

LEAVES: Simple, broad-ovate to oblong, turn bright yellow in autumn.

FLOWERS: Dioecious; very small greenish; male in racemes; female sessile in dense globular heads.

FRUIT: Large green ball; turning yellow when ripe; juice milky.

NUMBER: In

USE: Once popular as a farm hedge plant for fences. Now used extensively for fence posts. Indians used it for bows and war clubs.

SPECIMEN:

7a Twigs with complete stipular rings at each node. With large tulip-shaped flowers. 8

7b Twigs without stipular rings 11

8a Leaves square cut or with a large notch at end. Fig.62.
TULIPTREE Liriodĕndron tulipĭfera L.

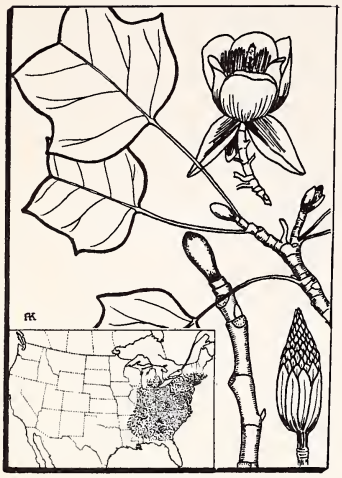


Figure 62

TREE: A beautiful tree to 200 ft. high and 8 to 10 ft. in diameter. Next to sycamore, likely our largest broad leaf tree.

BARK: Thin and scaly on young trees becoming deeply furrowed, brown.

LEAVES: Shining dark green above, lighter below.

FLOWERS: Large, tulip-like. Very attractive, petals pale green marked with orange. May and June.

FRUIT: Brown, cone-like about 1½ in. long, ripening late in September.

NUMBER: In

USE: Attractive shade tree. Wood known as yellow poplar, is highly valued for many commercial purposes.

SPECIMEN:

8b Leaves with normal pointed tips 9

THE MAGNOLIAS: Genus MAGNŌLIA

9a Leaves auriculate (earlike lobes at base), glabrous. Leaf-buds glabrous. Fig. 63.
EAR-LEAVED UMBRELLA TREE Magnōlia frasēri Walt.

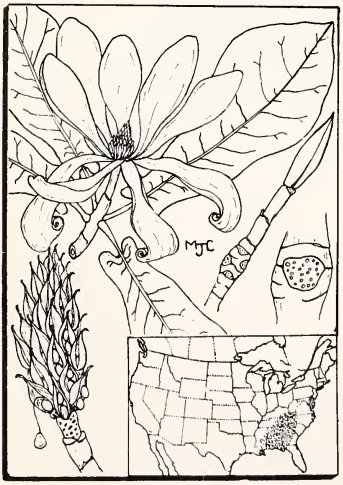


Figure 63

TREE: Widely spreading to 45 ft. high.

BARK: Thin, smooth, dark brown.

LEAVES: 6 to 20 in. long; smooth, dark green above, lighter below.

FLOWERS: 6 to 10 in. across, pale yellow, sweet scented.

FRUIT: 4 to 5 in. long; bright red.

NUMBER: In

USE: Ornamental.

SPECIMEN:

9b Leaves thin; rounded or truncate at base. Leaf-buds silky. Fig.64. CUCUMBER MAGNOLIA Magnōlia acumināta L.

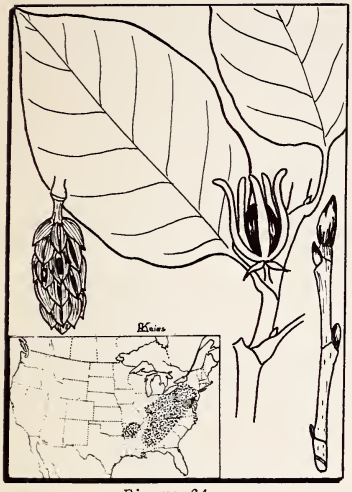


Figure 64

TREE: Large, straight trunk, pyramidal top, to 90 ft. high.

BARK: Dark brown, furrowed and covered with numerous thin scales, 1/3 to 1/2 in. thick.

LEAVES: Entire, 7 to 10 in. long, oblong or oval, rounded or slightly cordate at base. Dark green above, paler and more or less pubescent beneath.

FLOWERS: Large, oblong bell-shaped, more or less inclosed, pale yellowish-green, glaucous, membraneous sepals 1 to 1½ in. long. May.

FRUIT: Oblong, usually curved, glabrous, dark red when ripe.

NUMBER: In

USE: Shade, pump logs, troughs.

SPECIMEN:

9c Leaves 1 to 3 ft. long, cordate at base; white pubescent beneath. Fig.65. BIG LEAF MAGNOLIA Magnōlia macrophýlla Michx.

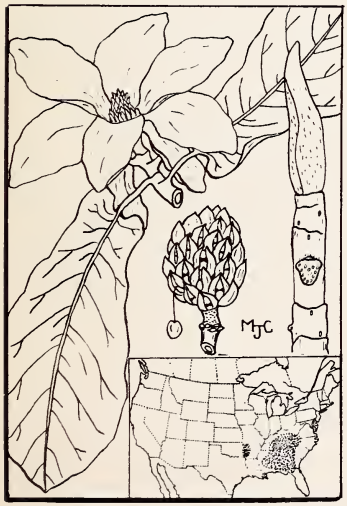


Figure 65

TREE: Rounded wide spreading top, to 60 ft. high.

BARK: Thin, light gray, smooth.

LEAVES: 1 to 3 ft. long, bright green and smooth above; whitish and pubescent beneath.

FLOWERS: 10 to 14 in. across; white with deep rose center.

FRUIT: 2 to 3 in. long; rose colored when ripe.

NUMBER: In

USE: Lumber. Ornamental.

SPECIMEN:

9d Leaves tapering at base. Fig.66. 10

10a Leaves 1 to 2 ft. long; light green beneath; leaf buds glabrous. Fig.66. UMBRELLA MAGNOLIA *Magnōlia tripĕtala* L.



Figure 66

TREE: Wide spread irregular crown to 40 ft. high.

BARK: Thin, smooth, light gray.

LEAVES: 12 to 20 in. long; at first pubescent below.

FLOWERS: White, fragrant 8 to 10 in. in diameter.

FRUIT: 2½ to 4 in. long; dark red.

NUMBER: In

USE: Ornamental tree. Some changed varieties produced by cultivation.

SPECIMEN:

10b Leaves 3 to 6 in. long, glaucous beneath. Leaf buds pubescent. Fig.67. SWEETBAY *Magnōlia virginiāna* L.

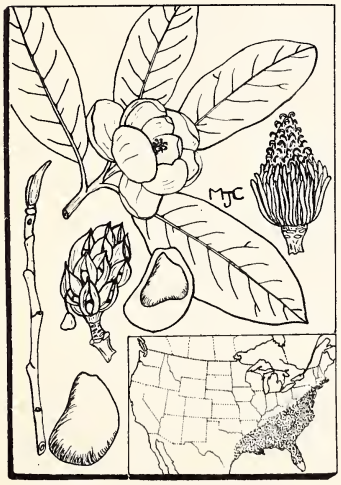


Figure 67

TREE: Slender tree or shrub to 75 ft. high.

BARK: Thin, smooth, gray.

LEAVES: Upper side bright green, whitish beneath. 3 to 6 in. long.

FLOWERS: 2 to 3 in. across; white; fragrant.

FRUIT: About 2 in. long, red; seeds oval, flattened.

NUMBER: In

USE: Ornamental planting.

SPECIMEN:

NOTE: There are several species of cultivated magnolias. Perhaps the most common is Soulange's Magnolia, *Magnōlia soulangiāna* Soul., a hybrid and which has been bred into several varieties. The flowers expand to 4 to 6 in. and are usually purplish or rose on the outside and white within.

11a Leaves evergreen (some leaves on wood of previous season), thick and leathery 12

11b No leaves on wood of previous season. 14

12a Bark aromatic. Leaves 4 to 5 in. long, pointed at both ends, bright green above, paler on under side. Wood red. Fig.68.
REDBAY Pĕrsea borbōnia Spreng.



Figure 68

TREE: Dense well rounded head to 70 ft. high.

BARK: Irregularly furrowed; dark red.

LEAVES: When mature thick and leathery, bright green above; whitish beneath; 3 to 4 in. long.

FLOWERS: Yellowish-white about 1/8 in. long.

FRUIT: Somewhat fleshy with single seed; shiny black or dark blue, 1/2 in. long.

NUMBER: In

USE: Wood strong, bright red in color. Cabinet work.

SPECIMEN:

12b Bark not aromatic 13

13a Leaves 3 to 4 in. long, light yellow-green beneath. Winter buds naked. Fig.69.
MOUNTAIN-LAUREL Kălmia latifōlia L.



Figure 69

TREE: Shrub or tree to 40 ft. high.

BARK: Thin, dark brown tinged with red.

LEAVES: Evergreen, thick when mature; dark green above, yellowish-green beneath.

FLOWERS: 1 in. across; white, pink or rose; in many flowered corymbs.

FRUIT: A woody capsule about 1/4 in. across.

NUMBER: In

USE: Ornamental. Honey made from its flowers is said to be poisonous.

SPECIMEN:

13b Leaves 4 to 12 in. long, green on both sides. Winter buds scaly. Fig.70.
GREAT-LAUREL Rhododĕndron măximum L.

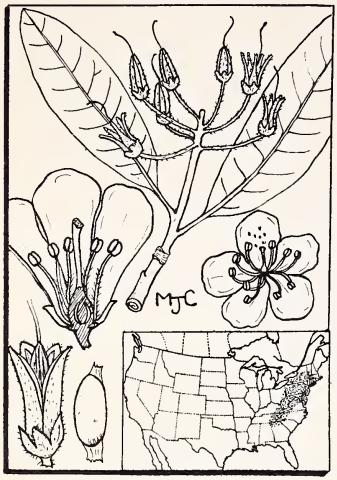


Figure 70

TREE: Shrub or tree to 40 ft. high.

BARK: Thin; light reddish-brown.

LEAVES: Evergreen, shiny dark green above, 4 to 12 in. long. Poisonous to stock.

FLOWERS: White, purplish or rose, about 1 in. across.

FRUIT: Woody capsule, reddish-brown; 1/2 in. long.

NUMBER: In

USE: Cultivated.

SPECIMEN:

14a Pith solid but with diaphragms. Fig.71 15

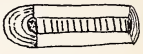


Figure 71

14b Pith not both diaphragmed and solid 16

15a Leaves 10 to 12 in. long, two ranked (in 2 rows on twig); with a disagreeable odor. Fig.72.
COMMON PAPAW Asĭmina trĭloba Dunal

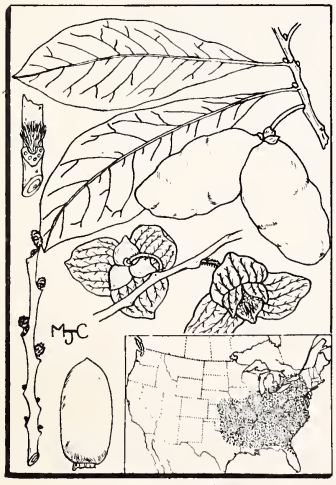


Figure 72

TREE: Shrub or small tree to 40 ft. high.

BARK: Smooth, dark.

LEAVES: At first pubescent, glabrous at maturity; 6 to 12 in. long.

FLOWERS: Deep purple; 1 to 1½ in. across.

FRUIT: A banana-like berry. 3 to 7 in. long and 1 to 2 in. thick. Large flattened seeds.

NUMBER: In

USE: Fruit sometimes marketed.

SPECIMEN:

15b Leaves 2 to 5 in. long, not two ranked. Figs.129-131. THE GUMS 68

16a Pith 5 angled when viewed in cross section; leaves usually with bristle at tip. Fruit an acorn. Fig.73a. THE OAKS (in part) 43



Figure 73

16b Pith cylindrical or nearly so. Fig.73b. .17

17a Underside of leaves and the young stems covered with silvery-white scurfy scales. Leaves 2 to 3 in. long. Flowers yellow covered with silvery scales. Fig.74.


Figure 74

RUSSIAN OLIVE Eleăgnus angustifōlia L.

TREE: Deciduous shrub or small tree to 20 ft. high; sometimes spiny. Branchlets silvery-white.

BARK: Shiny, smooth.

LEAVES: Lanceolate or oblong lanceolate. 2 to 3 in. long, light green above, silvery beneath.

FLOWERS: Golden yellow inside. 1 to 3 in the axils of the leaves; fragrant, June.

FRUIT: Oval, about 1/2 in, long, on very short stalks; yellow, covered with silvery scales.

NUMBER: In

USE: Ornamental

SPECIMEN:

17b Not as in 17a 18

18a Twigs of 2 or 3 years, bright green, shiny. Leaves entire or two or three lobed. Readily told by the odor of its bark, leaves and roots., Fig.75.


Figure 75

SASSAFRAS Săssafras ălbidum Nees

TREE: Small, aromatic; not more than 40 ft. high.

BARK: Red-brown, deeply furrowed, twigs bright green.

LEAVES: Some oval and entire 4 to 6 in. long, others have two lobes and still others three.

FLOWERS: Clustered, greenish-yellow, open with the unfolding of the leaves. April.

FRUIT: Oblong, dark blue or black; shining berry containing one seed.

NUMBER: In

USE: Posts, rails, boat-building; from the roots is extracted the very aromatic oil of sassafras.

SPECIMEN:

18b Twigs not green 19

19a Leaves tapering to a point at their tip 20

19b Leaves usually rounded or slightly notched at their tip. Fig.76. SMOKETREE Cótinus americānus Nutt.



Figure 76

TREE: Widely branched; to 35 ft. high.

BARK: Thin, furrowed, light grey.

LEAVES: 3 to 6 in. long; thin, glabrous or sometimes pubescent beneath.

FLOWERS: Dioecious; green, very small in large open panicles.

FRUIT: Drupe like, 1/8 in. long; seeds flat.

NUMBER: In

USE: Fence posts. Orange dye.

SPECIMEN:

20a Petioles (leaf stems) very slender, 1 to 2 inches long. Fig.233. BLUE CORNEL See 163b

20b Petioles short. 21

21a Bundle scars central. Branchlets without a terminal bud. Fruit, tomato shaped, smooth, green, 3/4 to 2 in. in diameter. Very astringent before frost. Fig.77.
PERSIMMON Diospȳ́ros virginiā́na L.

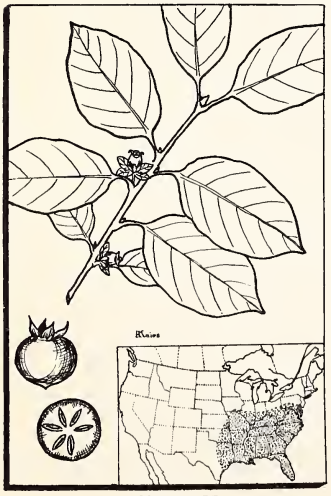


Figure 77

TREE: Small tree, rarely exceeding 50 ft. in height.

BARK: Almost black and separated into thick nearly square blocks.

LEAVES: 4-6 in. long, dark green and shining above, paler beneath.

FLOWERS: Yellowish or cream white, bell shaped. Appear in May.

FRUIT: Pulpy, round, orange colored berry, 1 in. or more in diameter with 4-12 flat oblong seeds. Ripe after first frost. Very puckery while green.

NUMBER: In

USE: Shuttles, golf stick heads. Edible fruit.

SPECIMEN:

21b Bundle scars central. Fruit, apple-like with fuzzy covering. Fig.78. QUINCE Cydōnia oblŏnga Mill.

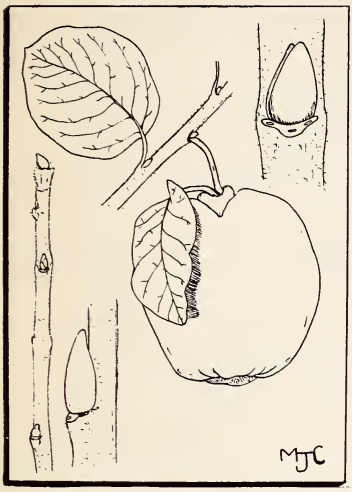


Figure 78

TREE: Round topped tree or shrub with crooked branches; to 20 ft. high.

BARK: Dark.

LEAVES: 2 to 4 in. long, tomentose beneath.

FLOWERS: White or pinkish; 1-1/4 to 2 in. across.

FRUIT: Apple-like pome; green turning yellow when ripe; covered with fuzz.

NUMBER: In

USE: Fruit.

SPECIMEN:

22a Lateral veins straight and parallel or nearly so, at least part of them ending in the teeth or lobes. Fig.79 23



Figure 79

22b Lateral veins not straight and parallel. Fig.80 63



Figure 80

23a Leaves and buds in two distinct rows on the stem. 24

23b Leaves and buds not in two rows on the stem 41

24a Leaf blades unequal at their base (the 2 sides not symmetrical) Fig.81a. 25

24b Leaf blades nearly equal at base. Fig.81b. 30



Figure 81

25a Axillary buds on stalks. Flowers appearing in late fall with ripening fruit of previous year. Fig.82.

WITCH HAZEL Hamamēlis virginiāna L.

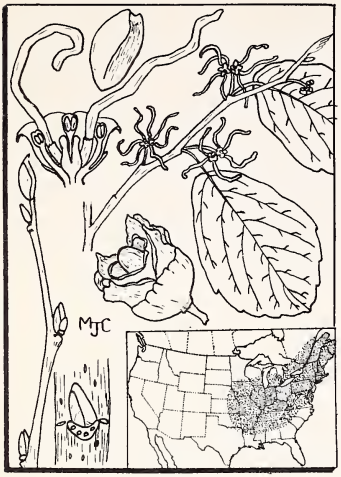


Figure 82

TREE: Shrub or tree to 25 ft. high.

BARK: Thin, broken into scales, light brown.

LEAVES: Unequal at base; dull green, lighter below; 4 to 6 in. long.

FLOWERS: Opening in late fall. Petals bright yellow; sepals, orange-brown.

FRUIT: Ripening during late fall of second year. 1/2 in. long; brown.

NUMBER: In

USE: Ornamental. In medicine.

SPECIMEN:

25b Buds sessile; leaves mostly doubly serrate. 26

THE ELMS: Genus ŬLMUS

26a Leaves very rough above; buds downy, reddish-brown; inner bark slippery; no cork wings on twigs. Flowers on short stems.* Fig.83.

SLIPPERY ELM Ŭlmus fŭlva Michx.

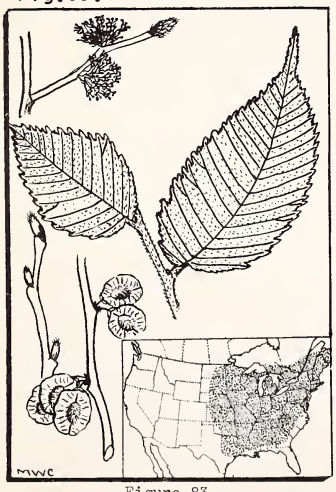


Figure 83

TREE: Height 60 to 70 ft. Trunk 2 to 3 ft. in diameter. Tree divides usually within a few feet of the ground into a few large limbs which branch and develop into a graceful broad topped head.

BARK: Brown, rough on old trees. Inner bark mucilaginous and medicinal.

LEAVES: Hairy on underside in contrast with American Elm.

FLOWERS: Small reddish-brown. Appearing before the leaves. March, April.

FRUIT: Flat, winged hairy seeds maturing in early spring.

NUMBER: In

USE: Wood and lumber.

SPECIMEN:

* NOTE: The Scotch Elm, Ŭlmus glăbra Juds. with leaves much roughened above but with smooth buds and no slippery bark is cultivated in various forms.

26b Leaves smooth or at most somewhat roughened above. Flowers on longer stems. 27

27a At least some of the branches with wing-like ridges, or twigs with short hairs. Fig.84. 28

27b Not as in 27a 29

28a Branchlets with broad corky wings. Fruit with narrow wings. Leaves 1 to 3 in. long. Fig.84. WINGED ELM *Ulmus alata* Michx.

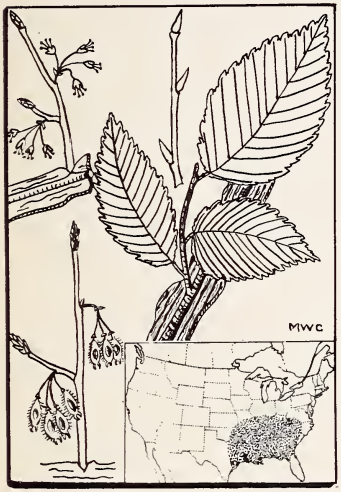


Figure 84

TREE: With open rounded top to 80 ft. high; usually much smaller.

BARK: Thin, light brown; on branches expanding into wing-like ridges.

LEAVES: When mature thick; dark green and smooth above; lighter and pubescent beneath, 1 to 3 in. long.

FLOWERS: Small drooping from fasicles.

FRUIT: Winged, brown ripening before leaves.

NUMBER: In

USE: Wood very compact. Implement manufacture.

SPECIMEN:

28b Branches often with corky wings. Fruit with broad wings. Leaves 2 to 5 in. long. Fig.85. ROCK ELM *Ulmus racemosa* Thomas



Figure 85

TREE: Straight, well balanced to 100 ft. high.

BARK: Branches sometimes with cork wings.

LEAVES: Dark green above, pale pubescent beneath; teeth incurved; 3 to 6 in. long.

FLOWERS: In racemes; anthers purple.

FRUIT: Winged; ripening when leaves are about half grown.

NUMBER: In

USE: Lumber: wood superior to that of the American Elm.

SPECIMEN:

29a Buds and fruit smooth.* **Leaves 4 to 6 in. long. Fig.86,**
AMERICAN ELM Ŭlmus americana L.

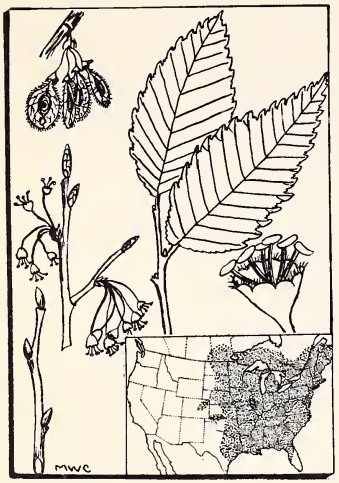


Figure 86

TREE: Large, spreading branches, drooping branchlets, to 125 ft. high.

BARK: Light gray, rough, flaky, ridged.

LEAVES: Oval, parallel veined, abruptly pointed, sharply serrate. Dark green, clear yellow in autumn; 3 to 6 in. long.

FLOWERS: In drooping clusters. Calyx green tinged with red above the middle; anthers bright red. April.

FRUIT: On long pedicels or stems in crowded clusters, ripening as the leaves unfold. One-seed, entirely surrounded by wing.

NUMBER: In

USE: Shade and lumber.

SPECIMEN:

* The English Elm Ŭlmus campĕstris L., often planted here appears in various forms. The leaves and fruit have shorter stems than the White Elm. Leaves 2-3 in. long.

29b Leaves 3/4 to 2 in. long, numerous, usually singly serrate. Smooth on both sides. Twigs brittle. Fig.87.
CHINESE ELM Ŭlmus pūmila L.



Figure 87

TREE: Broad rounded top with somewhat hanging twigs.

BARK: Gray, furrowed.

LEAVES: 3/4 to 2 in. long, usually with single teeth; dark green.

FLOWERS: Small, in axils of leaves.

FRUIT: Winged.

NUMBER: In

USE: Much planted for ornament and wind-breaks but apparently losing in popularity because of its brittleness and tendency to break up badly in storms or with ice.

SPECIMEN:

30a One fairly large simple serrate tooth for each lateral vein in which it ends 31

30b Not as in 30a 33

31a Leaves with slender points on the teeth, often incurving. Leaves usually more than twice as long as wide. Bark rough . .32

31b Leaves without slender points at tips; usually less than twice as long as wide. Bark smooth, light gray. Several three sided nuts born in the spiny fruit. Fig.88.

BEECH Fāgus grandifólia Ehrh.

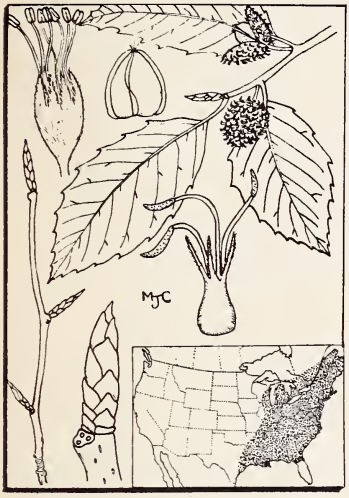


Figure 88

TREE: One of our most beautiful trees. To 100 ft. high.

BARK: Bluish-gray, very smooth.

LEAVES: 3 to 6 in. long; dark green above, paler beneath.

FLOWERS: Male, in globular heads about 1 in. in diameter; female, in pairs.

FRUIT: A very prickly bur about 3/4 in. long containing several brown, 3-sided nuts.

NUMBER: In

USE: Wooden-ware, furniture, etc. Nuts.

SPECIMEN:

32a Leaves green on both sides. Spiny fruit containing 2 or 3 nuts. Large trees. Fig.89. CHESTNUT Castánea dentāta Borkh.



Figure 89

TREE: Tall, straight, occasionally 100 ft. high.

BARK: Dark brown, broad flat ridges, twigs olive green tinged with yellow.

LEAVES: With coarse pointed teeth, smooth and green on both sides.

FLOWERS: Monoecious; the long slender whitish catkins opening in midsummer. Female, on the new wood, rather inconspicuous.

FRUIT: Prickly bur, nuts 2 to 3 in each involucre, flattened on one or both sides, very sweet.

NUMBER: In

USE: Posts, tannin, light building construction. Nuts to "pull from the fire".

SPECIMEN:

32b Under side of leaves densely covered with white hairs. Spiny fruit producing only one nut. Shrub or small tree. Fig.90.
CHINQUAPIN Castánea púmila Mill.



Figure 90

TREE: Small tree or shrub to 50 ft. high.

BARK: Light brown, tinged with red.

LEAVES: 3 to 5 in. long; bright yellow-green above and silvery pubescent beneath.

FLOWERS: Monoecious; male in catkins eventually 4 to 6 in. long; female, on smaller catkins with some male flowers.

FRUIT: A prickly bur 1 to 1½ in. in diameter with single nut.

NUMBER: In

USE: Ties, fence posts, etc.

SPECIMEN:

33a Lateral veins ending in only a part of the teeth or lobes .34

33b Lateral veins not ending in any of the marginal teeth.
SERVICEBERRY See Fig.125.

34a Bark smooth, bluish-gray; with projecting ridges on the trunk and larger branches. Staminate catkins not in evidence during the winter. Fig.91. BLUE BEECH Carpínus caroliniána Walt.

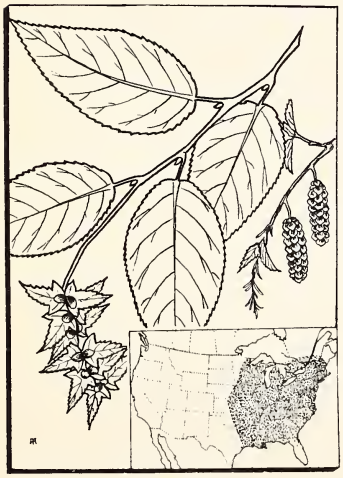


Figure 91

TREE: Low growing; found in thickets along river banks. To 40 ft. high, diameter 4 to 8 in.

BARK: Thin, close, greenish-gray with heavy rounded ridges.

LEAVES: Ovate-oblong, pointed, sharply double serrate, blue-green above, yellow-green below; 2 to 4 in. long.

FLOWERS: Male catkins over 1 in. long; female catkins less than 1 in. long; styles scarlet.

FRUIT: Single involucre-like bract; small ovate nut.

NUMBER: In

USE: One of the cultivated shade trees, not very common. Tool handles, levers, wedges. Wood tough and durable.

SPECIMEN:

34b Large branches without projecting ridges. Staminate catkins appearing in late summer and conspicuous throughout the winter 35

35a Bark of trunk brownish, with fine scales and furrows. Usually twisted spirally. Fruit hop-like, Fig.92.

IRONWOOD Ostrya virginiana Koch.



Figure 92

TREE: Slender short tree with very hard wood. Round crown in open. This is the so-called Ironwood.

BARK: Brownish and finely furrowed. Usually winds spirally on trunk and large branches.

LEAVES: Dull yellow-green, lighter beneath. 3 to 5 in. long.

FLOWERS: Male catkins 2 in. long when unfolding. Female catkins about 1/4 in. long.

FRUIT: Hop-like; seed inclosed in a bladdery elipsoid bag.

NUMBER: In

USE: Handles for tools and other implements where a strong hard wood is needed.

SPECIMEN:

35b Bark of various colors usually splitting into thin papery layers. Seeds numerous; born in scaly catkins 36

THE BIRCHES: Genus BĔTULA

36a Leaves with 9 to 11 pairs of veins; bark of twigs with wintergreen flavor; fruiting catkins sessile or nearly so. 37

36b Leaves with 5 to 9 pairs of veins; bark of twigs usually bitter; fruiting catkins with stems 38

37a Bark dark brown, not separating into layers; leaves heart-shaped or rounded at base, shining above. Fig.93.

SWEET BIRCH Bĕtula lĕnta L.



Figure 93

TREE: Graceful with somewhat hanging branches; to 75 ft. high.

BARK: Dark brown with reddish tinge. Bark and leaves aromatic.

LEAVES: Dark green and dull above, lighter beneath, 3 to 6 in. long.

FLOWERS: Male catkins from previous summer; 3 to 4 in. long in bloom. Female about 3/4 in. long.

FRUIT: Cone-like; 1 to 1½ in. long; bearing many seeds.

NUMBER: In

USE: Lumber, drugs.

SPECIMEN:

37b Bark yellow or silvery-white, separating into thin layers. Leaves dull above. Fig.94. YELLOW BIRCH Bĕtula lūtea Michx. f.

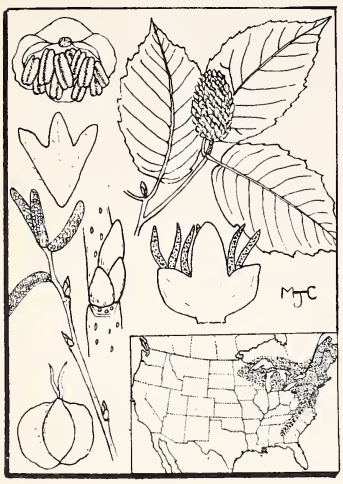


Figure 94

TREE: Broad round top, to 100 ft. high.

BARK: Young stems silvery-gray to orange; on old trunks reddish-brown.

LEAVES: Smooth, dull green, paler beneath, 2 to 5 in. long.

FLOWERS: Male catkins, when expanded 3 to 4 in. long. Female catkins about 3/4 in. long.

FRUIT: Erect, cone-like 1 to 1½ in. long.

NUMBER: In

USE: Furniture, flooring, etc.

SPECIMEN:

38a Bark light reddish-brown. Fruiting catkins erect. Fig.95. RIVER BIRCH Bĕtula nĭgra L.

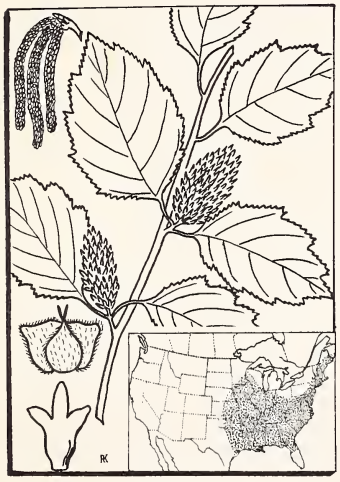


Figure 95

TREE: Slender, to 90 ft. high. Branches drooping.

BARK: Orange-red, or greenish-brown, peeling in thin layers.

LEAVES: Dark green above, paler beneath. Acute at both ends, irregularly serrate; 2 to 4 in. long.

FLOWERS: Male catkins, when extended 2 to 3 in. long. Female, about 1/2 in. long. March, April.

FRUIT: Cone-like, 1 to 1½ in. long bearing many tiny winged nuts. Ripens in May or June.

NUMBER: In

USE: Furniture, wooden shoes, etc.

SPECIMEN:

38b Bark of trunk and larger branches white; fruiting catkins hanging or spreading 39

39a Bark not easily separable into thin layers. Fig.96.,
GRAY BIRCH Bĕtula populifōlia Marsh

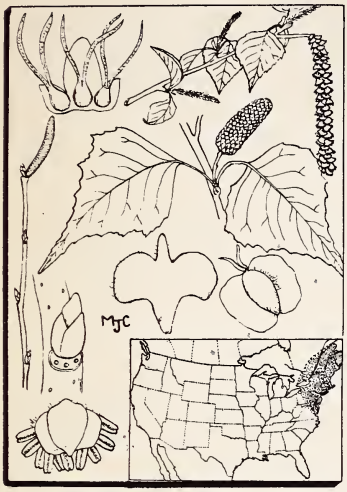


Figure 96

TREE: Smallest of the birches; to 40 ft. high.

BARK: Thin, chalk-white.

LEAVES: Shiny dark green; 2½ to 3 in. long.

FLOWERS: Male catkins, 2½ to 4 in. when expanded; Female catkins, about 1/2 in. long.

FRUIT: Cone-like about 3/4 in. long producing many winged nutlets.

NUMBER: In

USE: Clothes pins, spools, shoe pegs, hoops, etc.

SPECIMEN:

39b Bark peeling in thin layers 40

40a Cultivated. Leaves of various forms. Twigs often hanging. Fig.97.
EUROPEAN WHITE BIRCH Bĕtula ălba L.

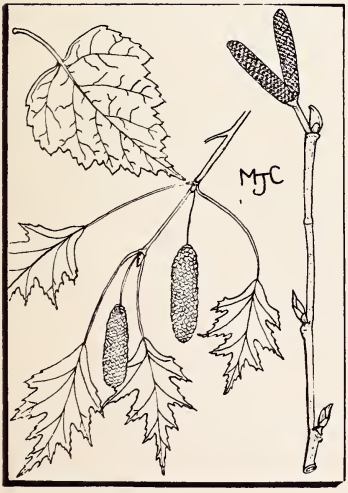


Figure 97

TREE: Spreading branches, drooping, much cultivated for ornament, short lived.

BARK: Chalky-white marked with black expanded lenticels.

LEAVES: Rather deeply cut with fine serrations, some varieties very much cut; 2 to 3 in. long.

FLOWERS: Staminate catkins clustered, sessile, 1 in. long, expanding to 3 in; 1/8 in. thick; pistillate catkins, slender, cylindric, 1/2 in. long. May.

FRUIT: Numerous small winged seeds in cone-like bodies.

NUMBER: In

USE: Ornamental.

SPECIMEN:

40b Leaves ovate. Scales of the catkins glabrous. Fig.98.
CANOE BIRCH Bĕtula papyrĭfera Marsh

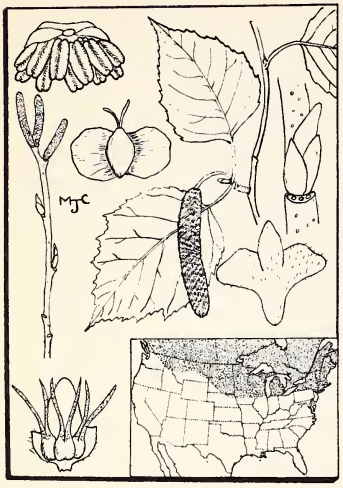


Figure 98

TREE: Irregular rounded top; rarely to 120 ft. high.

BARK: Smooth, creamy-white with long dark horizontal lenticels.

LEAVES: Dull dark green above, yellow-green beneath; 2 to 4 in. long.

FLOWERS: Male catkins, in winter 3/4 to 1-1/4 in., expanding to 4 in. long. Female, 1 to 1-1/4 in. long.

FRUIT: About 1½ in. long.

NUMBER: In

USE: Indians use bark for canoes and many other articles. Wood also valuable.

SPECIMEN:

41a Pith in cross-section five-angled, buds not stalked. Fig.99 42



Figure 99

41b Buds stalked, pith three-angled.* Fig.100.
BLACK ALDER Alnus glutinōsa Gaertn.



Figure 100

TREE: Introduced from Europe and Africa. Rounded top to 70 ft. high.

BARK: Gray, lightly furrowed.

LEAVES: 2 to 5 in. long; glabrous dull dark green above.

FLOWERS: Male catkins, 2 to 3 in. long. Female, 1/2 in. long.

FRUIT: Cone-like with many wingless seeds.

NUMBER: In

USE: A valuable wood, spools, wooden shoes, wooden ware, etc.

SPECIMEN:

* NOTE: Two or three species of native shrubs or small trees belong here. They have more or less pointed leaves.

42a Leaves with sharply pointed even teeth; fruit prickly, enclosing one or more nuts. CHESTNUT, etc. See 32a and 32b, page 49.

42b Fruit an acorn (nut with cup-like base). Leaves round lobed or sharp lobed or entire with bristle tip at end of leaf and lobes. Fig.101. 43

42c Trees not as in 42a or 42b. 61

THE OAKS: Genus QUĔRCUS



Figure 101

43a Leaves or their lobes bristle tipped; acorns maturing at end of second season. Fig.101b 44

43b Leaves and their lobes rounded without bristle tips; acorns ripening the first year. Fig.101a 54

44a Leaves entire, oblong or lanceolate; 3 to 6 times as long as wide. Fig.102 45

44b Leaves more or less deeply lobed on sides. Fig.101b. . . .48

44c Leaves wider above the middle, often with 3 to 5 lobes on this outer region. 47

45a Leaves pubescent on under side. Fig.102.

SHINGLE OAK Quĕrcus imbricāria Michx.



Figure 102

TREE: Handsome, rounded top; to 100 ft. high.

BARK: Dark brown to nearly black; on trunk, deeply fissured.

LEAVES: Narrow, oblong; thickish, smooth and shining above; downy beneath. Entire, 3 to 6 in. long, spine at tip. Turn brown and remain on tree during winter.

FLOWERS: Male, long yellowish catkins in early spring. Female, green, small.

FRUIT: Solitary acorns, or 2 to 3 together with short stems, brown nut about 1/2 in. long and 1/3 enclosed in flatish cup of small scales, reddish-brown. Matures second season.

NUMBER: In

USE: Interior finishing, furniture, clapboards, shingles.

SPECIMEN:

45b Leaves glabrous 46

46a Leaves lanceolate, green on both sides, falling in autumn.* Fig.103. WILLOW OAK Quĕrcus phĕllos L.

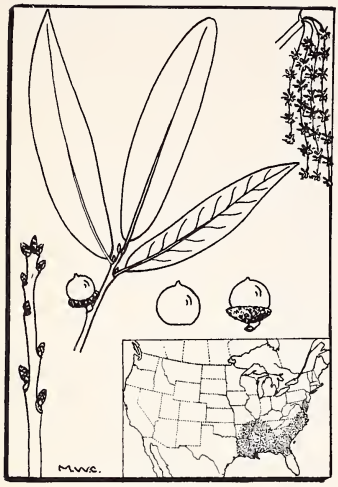


Figure 103

TREE: With rather narrow open top; to 90 ft. high.

BARK: Reddish-brown; somewhat roughened.

LEAVES: Shiny and light green above; paler and sometimes pubescent beneath; 2½ to 5 in. long.

FLOWERS: Male catkins 2 to 3 in. long. Female, small with bright red stigmas.

FRUIT: Sessile or short stocked acorns, 1's or 2's; bitter.

NUMBER: In

USE: Wood inferior. Fuel and lumber.

SPECIMEN:

46b Leaves usually widest at upper half, falling in late winter. Fig.104. LAUREL OAK Quĕrcus laurifōlia Michx.

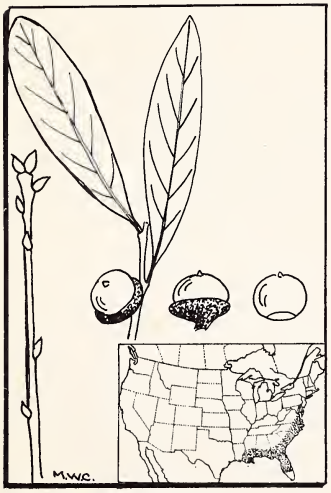


Figure 104

TREE: With dense and broad rounded head; to 100 ft. high.

BARK: Deeply ridged; dark.

LEAVES: 3 to 4 in. long; shiny green above; less shiny and paler below.

FLOWERS: Male catkins, 2 to 3 in. long. Stigmas of female flowers dark red.

FRUIT: Mostly solitary; sessile or nearly so; flat saucer-shaped cup.

NUMBER: In

USE: Lumber and fuel.

SPECIMEN:

* NOTE: Almost 80 species of Oaks are known in the entire United States. In addition to these there are many others that are thought to be natural hybrids of two existing species.

47a Leaves rounded or cordate at base, with brown tufts of hairs on under side. Fig.105.
BLACKJACK OAK Quĕrcus marilăndica Muench.

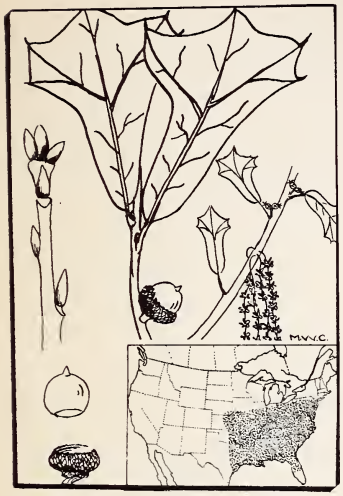


Figure 105

TREE: With well rounded wide spreading top to 50 ft. high.

BARK: Deeply ridged, nearly black.

LEAVES: 5 to 7 in. long; thick, shiny, dark green above; yellowish with scurfy pubescence below.

FLOWERS: Male catkins, hairy 2 to 4 in. long. Female flowers, hairy with dark red stigmas.

FRUIT: On short stems in 1's or 2's.

NUMBER: In

USE: Fuel and charcoal.

SPECIMEN:

47b Leaves wedge-shaped at base; glabrous on both sides. Fig.106.
WATER OAK Quĕrcus nigra L.

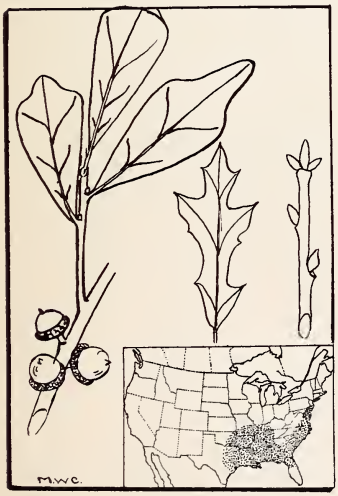


Figure 106

TREE: Growing in moist bottom land. Top narrow and rounded; to 80 ft. high.

BARK: Light brown; rather smooth.

LEAVES: Dull bluish-green, paler below; 2 to 3 in. long.

FLOWERS: Male catkins, 2 to 3 in. long. Stigmas of female flowers red.

FRUIT: Short stalked acorns about 1/2 in. long.

NUMBER: In

USE: Shade tree in South. Fuel and charcoal.

SPECIMEN:

48a Leaves whitish or grayish on underside. 49

48b Leaves green on both sides. 50

49a Leaves 3 to 11 lobed. Large tree 70 to 120 ft. high. Fig.107.
SOUTHERN RED OAK Quĕrcus rūbra L.



Figure 107

TREE: With broad open head to 80 ft. or more high.

BARK: Broadly ridged; pale to darker brown.

LEAVES: In two forms as pictured; 5 to 7 in. long. Shiny dark green above, and with pale or rusty pubescence beneath.

FLOWERS: Male, hairy catkins 3 to 5 in. long. Female flowers, pubescent with dark red stigmas.

FRUIT: Acorn, about 1/2 in. long; sessile or nearly so.

NUMBER: In

USE: Lumber and furniture.

SPECIMEN:

49b Small tree 18 to 20 ft. high. Leaves usually with 5 lobes. Fig.108.
BEAR OAK Quĕrcus ilicifōlia Wang.

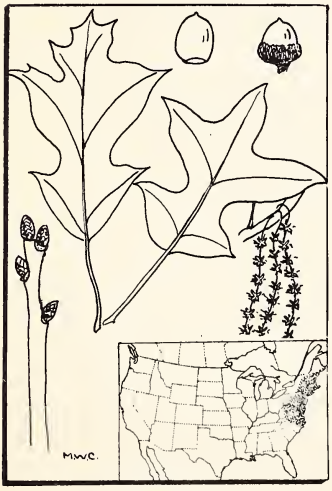


Figure 108

TREE: With slender spreading branches to 20 ft. high.

BARK: Dark brown, smooth, thin.

LEAVES: Shiny dark green above; pale beneath turning yellow to scarlet in fall; 2 to 5 in. long.

FLOWERS: Male catkins, red or greenish, 4 to 5 in. long; female flowers red.

FRUIT: Acorns usually borne in pairs, very numerous about 1/2 in. long.

NUMBER: In

USE: Posts, fuel.

SPECIMEN:

50a Leaves usually dull on upper side; 7 to 11 lobes. Acorns large. Cup, 3/4 to 1 in. across. Fig.109.
NORTHERN RED OAK Quĕrcus boreālis Michx.f.



Figure 109

TREE: One of the largest of the Oaks. Wide, rounded top with few far-reaching branches; to 125 ft. high.

BARK: Dark gray and roughened.

LEAVES: 4 to 8 in. long. Dark green above, paler beneath.

FLOWERS: Male catkins, pubescent, 4 to 5 in. long; female flowers with red scales and stigmas. Appear in May and June.

FRUIT: Ripe in October of second year. Single or in pairs, with short stalk. Acorn is largest of our Oaks, with hollow, saucer-shaped cup, covered with reddish-scales.

NUMBER: In

USE: Lumber for interior finish and furniture.

SPECIMEN:

50b Leaves shiny. Acorns smaller 51

51a Leaves usually pubescent below; buds pointed and hairy. Inner bark orange. Fig.110. BLACK OAK Quĕrcus velūtina Lam.

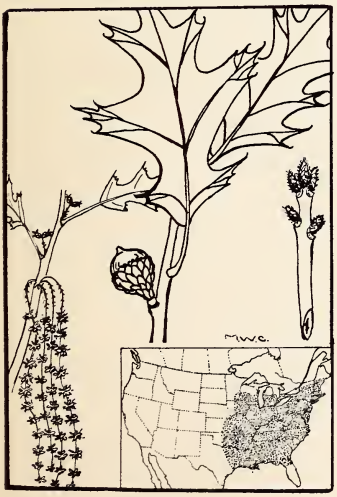


Figure 110

TREE: Large, with spreading branches, narrow open head. Trunk 3 to 4 ft. in diameter and 70 to 100 ft. high. Wood heavy, hard, strong and coarse grained.

BARK: Dark brown and rough. Very thick on old trees. Bright orange internally.

LEAVES: 5 to 6 in. long and 3 to 4 in. wide. Bristle tipped.

FLOWERS: Male catkins 4 to 6 in. long. Stigmas of female flowers bright red.

FRUIT: Short stalked appearing singly or in pairs. Inclosed about half its length. Ripens in second year.

NUMBER: In

USE: Bark contains a valuable dye and also tannin. Wood valuable.

SPECIMEN:

51b Leaves glabrous on both sides but sometimes with tufts of hair on under side 52

52a Cup of acorn much broader than high 53

52b Cup of acorn deep. Leaves 5 to 9 lobed, the lobes with teeth. Fig.111.

SCARLET OAK Quĕrcus coccĭnea Muench

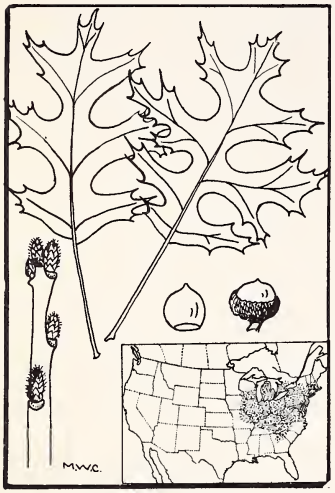


Figure 111

TREE: With narrow open head; to 80 ft. high.

BARK: Brownish with rather fine fissures.

LEAVES: Deeply divided 3 to 6 in. long. Very shiny, bright green above; paler beneath sometimes with pubescence on veins; turning brilliant scarlet in fall.

FLOWERS: Male catkins, glabrous, 3 to 4 in. long, bright red. Female flowers, 1/2 in. long, bright red.

FRUIT: Acorn 1/2 to 1 in. long.

NUMBER: In

USE: Furniture, interior work.

SPECIMEN:

53a Leaves differing on upper and lower branches. Acorns tapering, with shallow cup. Fig.112.

SHUMARD RED OAK Quĕrcus shumărdii Buckley

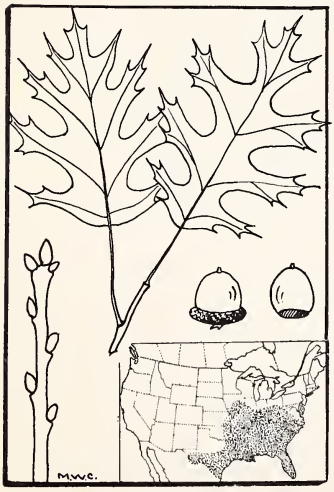


Figure 112

TREE: With wide spreading head to 120 ft. high.

BARK: Light brown tinged with red.

LEAVES: Lustrous, dark green and smooth above, paler beneath. 3 to 5 in. long.

FLOWERS: Male catkins, slender, 6 to 7 in. long. Female, with bright red stigmas; 1/2 in. long.

FRUIT: Short stalked, about 1 in. long.

NUMBER: In

USE: Posts and lumber.

SPECIMEN:

53b Leaves 5 to 7 lobed, toothed. Acorns somewhat elongate. Fig.113.

JACK OAK Quĕrcus ellipsoidālis Hill

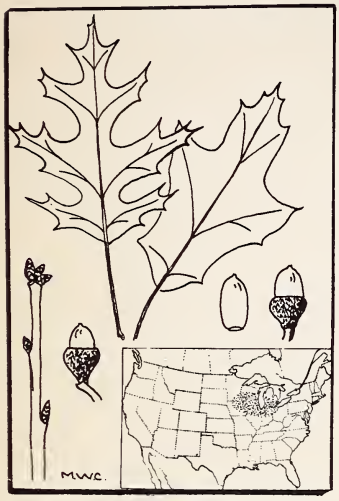


Figure 113

TREE: With dense narrow oblong head; to 70 ft. high.

BARK: Brown, with shallow furrows.

LEAVES: Deeply divided, bright green above, paler beneath, 3 to 5 in. long.

FLOWERS: Male catkins, reddish, 1½ to 2 in. long. Female flowers in groups of 2 or 3; red.

FRUIT: Solitary or in pairs; chestnut brown.

NUMBER: In

USE: Lumber, posts, ties.

SPECIMEN:

53c Leaves 5 to 7 in. deeply lobed. Acorns globose; cup, shallow-saucer shaped. Fig.114.

PIN OAK Quĕrcus palŭstris Muench.

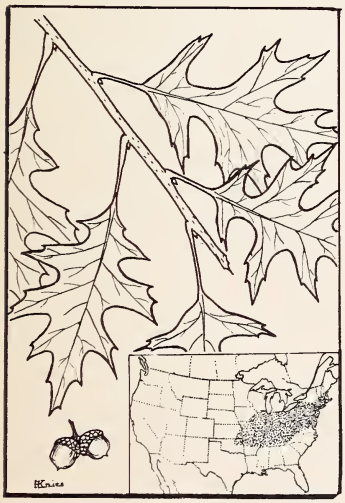


Figure 114

TREE: With open irregular top; to 100 ft. high. When shaded, with pin-like stubs of dead branches giving it its name.

BARK: Light brown, rather smooth.

LEAVES: With wide deep cuts. Shining dark green above, pale below. 4 to 6 in. long.

FLOWERS: Male catkins, hairy, 2 to 3 in. long. Stigmas bright red.

FRUIT: About 1/2 in. long; sessile or nearly so.

NUMBER: In

USE: Ornamental and shade tree. Lumber.

SPECIMEN:

54a Leaves pinnately lobed. Fig.120. 58

54b Leaves not lobed. 55

55a Leaves with coarse teeth. THE CHESTNUT OAKS. 56

55b Leaves entire, very thick and leathery, evergreen. Fig.115.
LIVE OAK Quĕrcus virginiāna Mill.

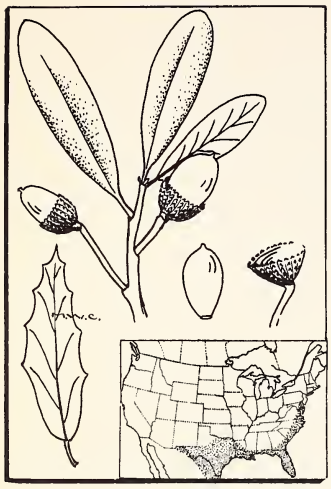


Figure 115

TREE: With massive trunk to 8 ft. in diameter and wide spreading branches; to 60 ft. high.

BARK: Dark brown with reddish tinge.

LEAVES: Evergreen, thick and leathery. Shining dark green above, with white pubescence beneath. Fall when new leaves appear.

FLOWERS: Hairy catkins, light yellow, 2 to 3 in. long; stigmas of female flowers bright red.

FRUIT: One to 5 acorns borne on a 1 to 5 in. stem. Acorns about 1 in. long.

NUMBER: In

USE: Once very important for ship building.

SPECIMEN:

56a Fruit stems longer than the leaf stems. Leaves wedge-shaped at base, whitish beneath usually widest beyond the middle. Fig.116.
SWAMP WHITE OAK Quĕrcus bicolor Willd.



Figure 116

TREE: With broad round top; to 100 ft. high and trunk diameter, 9 ft.

BARK: Young stems and small branches, smooth, reddish or purplish brown; on trunk a flaky gray.

LEAVES: Shining dark green above, white pubescent beneath; 5 to 6 in. long.

FLOWERS: Staminate, hairy catkins 3 to 4 in. long. Stigmas bright red.

FRUIT: Acorns maturing 1st year. Usually in pairs on slender stalks, 1½ to 4 in. in length.

NUMBER: In

USE: Interior construction of houses, cooperage, railroad ties, posts.

SPECIMEN:

56b Fruit stems about as long or shorter than the leaf stems. Acorns 1 in. or more in length 57

56c Fruit sessile or nearly so, less than 1 in. long. Fig.117.
CHINQUAPIN OAK Quĕrcus muhlenbĕrgii Engelm.



Figure 117

TREE: Tall, straight; to 100 ft. high; 3 to 4 in. in diameter.

BARK: Light gray tinged with brown. Smooth.

LEAVES: Green on upper surface, pale or silvery beneath. 4 to 7 in. long.

FLOWERS: Staminate, in hairy yellowish catkins, 3 to 4 in. long. Female flowers with heavy coat of white hairs.

FRUIT: Acorns solitary or in pairs, 1/2 to 1 in. long, light chestnut brown.

NUMBER: In

USE: Cooperage, wheels, fencing and ties.

SPECIMEN:

57a Teeth of leaves acute; fruit short stemed or rarely nearly sessile. Leaves often silver-white on under side. Fig.118.
SWAMP CHESTNUT OAK Quĕrcus prinus L.

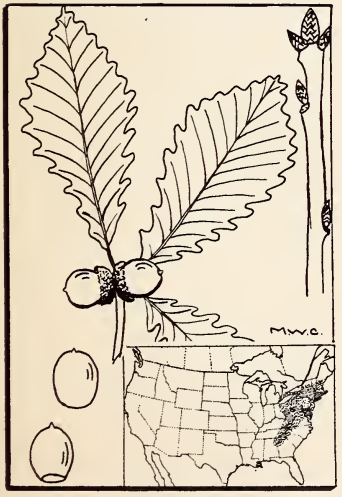


Figure 118

TREE: With compact round toped head; to 100 ft. high.

BARK: Light gray.

LEAVES: Shining dark green, pale green or silvery-white below; often pubescent. 6 to 8 in. long.

FLOWERS: Male, slender catkins 3 to 4 in. long. Female, with dark red stigma.

FRUIT: Single or in pairs 1 to 1½ in. long. Seed edible.

NUMBER: In

USE: Furniture, baskets, implements.

SPECIMEN:

57b Teeth of leaves rounded, pale green on under side. Fig.119.
CHESTNUT OAK Quĕrcus montăna Willd.

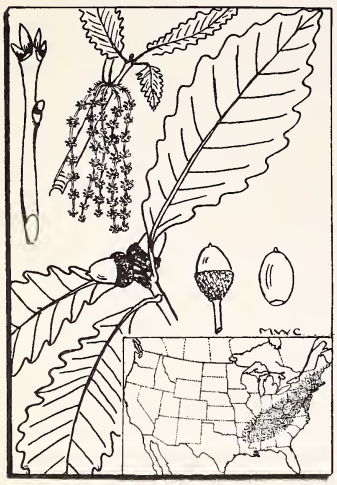


Figure 119

TREE: With open irregular head; to 100 ft. high.

BARK: Black or dark brown, broadly ridged.

LEAVES: Yellowish-green; pale with fine pubescence beneath; 4 to 9 in. long.

FLOWERS: Male catkins yellow, hairy, 6 to 8 in. long. Stigmas of female flowers dark red.

FRUIT: Single or in pairs on short stems; 1 to 1½ in. long.

NUMBER: In

USE: Lumber. Bark for tanning.

SPECIMEN:

58a Cup of acorn shallow. 59

58b Cup of acorn deep with ragged edge. 60

59a Leaves glabrous on under side; deeply cut into 3 to 9 lobes. Large trees with closely furrowed light gray bark.* Fig.120.
WHITE OAK Quĕrcus ălba L.



Figure 120

TREE: One of our most valuable and beautiful trees, 150 ft. high, trunk 4 to 5 ft. in diameter. Isolated forms broad top, strong and solid.

BARK: Light, scaly, ridged.

LEAVES: Dark green above, paler beneath; 5 to 9 in. long.

FLOWERS: Long yellowish male catkins to 3 in. long; female flowers bright red.

FRUIT: Matures first autumn; acorn 3/4 in. long.

NUMBER: In

USE: Implement making, furniture making, interior finish.

SPECIMEN:

* NOTE: The English Oak, Quĕrcus rōbur L, is cultivated in many cut leafed, yellow leafed and other sport variations. It differs from our White Oak in that its bark while furrowed, is not scaly.

59b Leaves pubescent beneath, rather coarsely and deeply five lobed. Smaller trees; bark reddish-brown. Fig.121.

POST OAK Quĕ́rcus stellā́ta Wang.

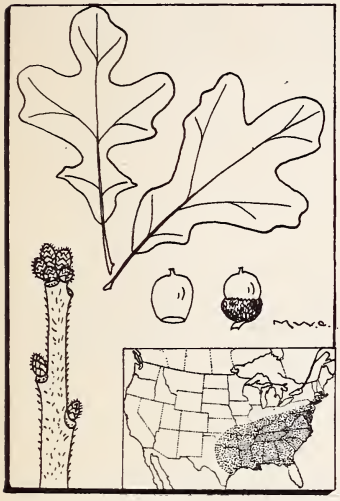


Figure 121

TREE: With stout branches and well rounded top; to 60 ft. or occasionally 100 ft. high.

BARK: Reddish-brown with deep fissures and broad ridges.

LEAVES: Arranged in star-shaped clusters as indicated by species name; dark green turning to various shades of yellow and brown in fall; 3 to 5 in. long.

FLOWERS: Male catkins, yellow 3 to 4 in. long. Stigmas bright red.

FRUIT: Ripening first year; 1/2 to 1 in. long.

NUMBER: In

USE: Wood hard and durable. Casks, implements, ties, posts, etc.

SPECIMEN:

60a Nut enclosed in the cup, or nearly so. Leaves narrower than 60b. Fig.122.

OVERCUP OAK Quĕ́rcus lyrā́ta Walt.

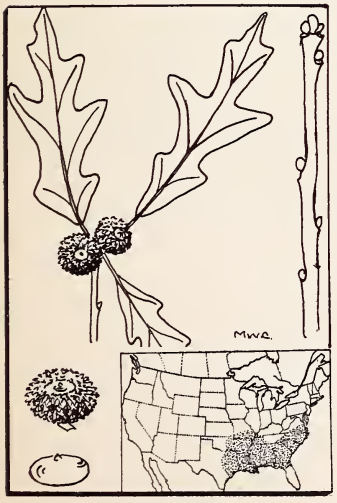


Figure 122

TREE: Grows where it can keep its "feet" wet. 100 ft. high though often not over 60 ft.

BARK: With scaly plates; light gray.

LEAVES: Shining dark green with white hairy under surface; 5 to 9 in. long.

FLOWERS: Male catkins hairy, light yellow, 3 to 6 in. long; female flowers pale.

FRUIT: Nut, almost wholly overgrown by the cup. Reddish-brown, 1/2 to 1 in. long.

NUMBER: In

USE: A valuable wood. Barrels interior finish, furniture, implements, etc.

SPECIMEN:

60b Nut at maturity about half exposed from cup. Leaves enlarged and toothed beyond middle as shown. Fig.123.
BURR OAK *Quĕrcus macrocărpa* Michx.

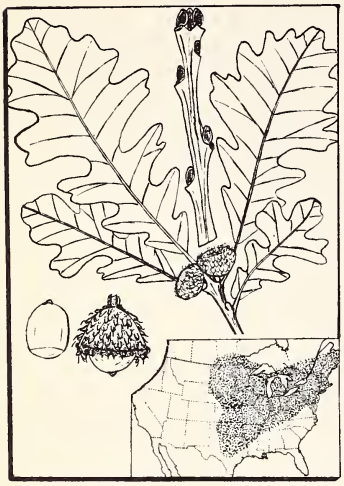


Figure 123

TREE: Large, rounded top; to 160 ft. high. Trunk to 8 ft. in diameter.

BARK: Dark brown, deeply furrowed.

LEAVES: Thin; when mature, bright green and shining above; whitish pubescence beneath; 5 to 9 in. long.

FLOWERS: Male catkins slender, 2 to 6 in. long; calyx yellowish.

FRUIT: Acorn, solitary or in pairs. 1/2 to 1 in. in length. Cup covering half or more of the nut, heavily fringed.

NUMBER: In

USE: For ship building, furniture, fuel, and railway ties.

SPECIMEN:

61a Branches with sharp pointed spines, single or branched. Small apple-like fruit with bony center.
THE HAWTHORNS, See 91a, Fig.154.

61b Without sharp pointed spines, carpels not bony. 62

62a Flowers in racemes; winter buds long. Fruit small, blue or black. SERVICEBERRY See 64b, Fig.125.

62b Flowers in umbels; no thorns but sometimes with stunted branches. Fruit apple-like. MALUS. 96

63a Leaves in two rows on the stem. 64

63b Leaves not in two rows on the stem. 65

64a Leaves with double serrations on lobes or teeth in which the veins end. Bark separating into papery sheets. Fig.124. THE BIRCHES See page 51.



Figure 124

64b Lateral veins not ending in the serrations. Fig.125.
SERVICEBERRY Amelănchier canadĕnsis Medic.



Figure 125

TREE: Shrubby, with narrow rounded top. Trunk 12 to 18 in. in diameter. Tree to 40 ft. high.

BARK: Smooth, dark ashy gray.

LEAVES: When young folded lengthwise and brownish-purple. 2½ to 4 in. long.

FLOWERS: Very showy, large, drooping, white, five petaled. Appear before or with leaves. April.

FRUIT: Borne on elongated pedicels. Crimson or purplish, tasteless, dry. 1/4 in. in diameter. Ripens in June-July. Falls early.

NUMBER: In

USE: Very ornamental in spring.

SPECIMEN:

65a Leaves evergreen, stiff with spine at end of each lobe. Fig.126.
AMERICAN HOLLY Ilex opāca Ait.



Figure 126

TREE: Well known Christmas decoration. Narrow pointed top to 80 ft. high.

BARK: Light gray, with wart-like roughenings.

LEAVES: Evergreen; retained for three years; dull yellow-green, lighter below. 2 to 4 in. long.

FLOWERS: Male, in 3 to 10 flowered cymes; female, in groups of 1 to 3.

FRUIT: Globose or elongate berry about 1/3 in. in diameter, with 2 or 3 roughened seeds; usually bright red; ripening in fall and retained through the winter.

NUMBER: In

USE: Wood white; used for turning and cabinet work.

SPECIMEN:

65b Not evergreen 66

66a Pith solid. 67

66b Pith not solid; diaphragmed. Fruit 4 winged. Fig.127.
SILVERBELL Halēsia carolīna L.

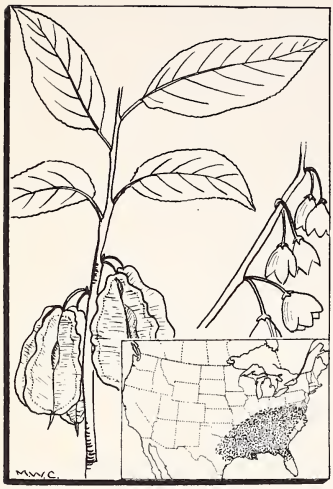


Figure 127

TREE: With rounded head; to 40 ft. high.

BARK: Reddish-brown, somewhat ridged.

LEAVES: Pubescent. Dark yellowish-green; pale beneath, 3 to 6 in. long.

FLOWERS: Bell-shaped about 1/2 in. long; white; sometimes tinged with rose.

FRUIT: 1½ in. long, 4 winged.

NUMBER: In

USE: Ornamental.

SPECIMEN:

67a Without diaphragms. Fig.128a 70

67b With prominent diaphragms in pith. Fig.128b. .68

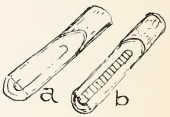


Figure 128

THE GUMS: Genus NŸSSA

68a Leaves usually dentate. Carpelate flowers solitary, fruit one inch or more long. Fig.129.
TUPELO GUM Nŷssa aquătica Marsh.



Figure 129

TREE: With narrow pointed top to 100 ft. high.

BARK: Dark brown roughened with small scales.

LEAVES: Thick, shining dark green; pale and somewhat downy beneath. 5 to 7 in. long.

FLOWERS: Small greenish white; male in spherical clusters; female solitary. Early spring.

FRUIT: Drupe 1 in. long on long stem, dark purple.

NUMBER: In

USE: Wooden shoes, wooden ware, boxes, etc.

SPECIMEN:

68b Leaves mostly entire; fruit less than 3/4 of an in. long; carpellate flowers in clusters of 2 or more. 69

69a Leaves mostly obtuse at tip. Carpellate flowers in clusters of 2 or 3. Seed much flattened and ribbed. Fig.130.
SWAMP BLACK GUM Nȳssa biflōra Walt.

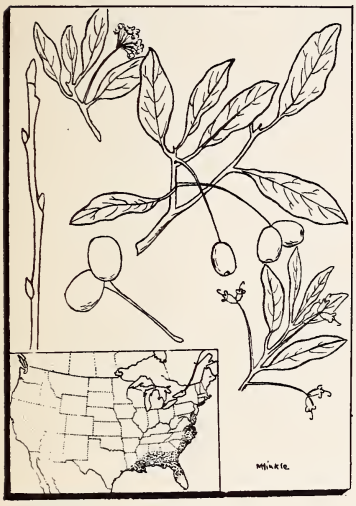


Figure 130

TREE: With tapering top to 75 ft. high.

BARK: Dark reddish-brown or gray; deeply furrowed.

LEAVES: Shining dark green, paler beneath. 2 to 4 in. long.

FLOWERS: Male, in open clusters, small white; female, in pairs on long peduncles.

FRUIT: About 1/3 in. long, single or in pairs, shining dark blue when ripe.

NUMBER: In

USE: Wooden ware, implements, crates, etc.

SPECIMEN:

69b Leaves mostly acute at tip. Carpellate flowers in clusters of 2 to 14. Seed but little flattened and ribbed. Fig.131.
BLACK GUM Nȳssa sylvătica Marsh

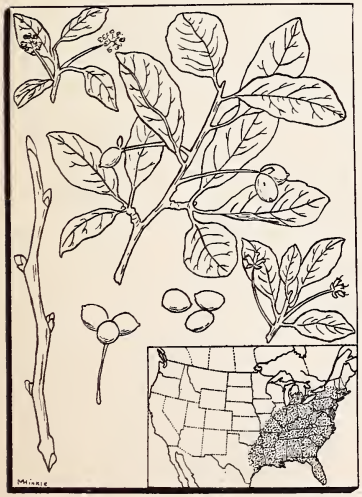


Figure 131

TREE: With rounded head to 100 ft. high. Trunk diameter to 5 ft.

BARK: Thick, light brown, deeply fissured.

LEAVES: Shining dark green above, somewhat pubescent beneath. 3 to 5 in. long.

FLOWERS: Male in many flowered clusters; female 2 to a few in a cluster.

FRUIT: Drupe about 1/2 in. long, dark blue; 1 to 3 on each stem.

NUMBER: In

USE: Wooden shoes, wheel parts, implements.

SPECIMEN:

70a Buds with more than 1 scale 82

70b Buds wholly covered with one scale. Staminate and carpellate flowers on separate trees; both in catkins. Figs.132 to 143. .71

THE WILLOWS: Genus SĀLIX

71a Twigs either erect or drooping but not "weeping". 72

71b Twigs long and hanging limply suspended. Introduced. Fig.132. WEEPING WILLOW Sālix babylŏnica L.



Figure 132

TREE: Rounded top with long slender hanging branches; to 60 ft. high and 5 ft. in trunk diameter. Introduced from eastern Europe.

BARK: Gray, ridged.

LEAVES: Smooth, dark green above, pale beneath; 3 to 6 in. long. Small stipules.

FLOWERS: Slender catkins about 1 in. long.

FRUIT: Small brown seeds with many whitish hairs for flight.

NUMBER: In

USE: Ornamental.

SPECIMEN:

72a Leaves with very short petiole or sessile, usually pale yellowish-green, very narrow. Stamens 2. Fig.133. SANDBAR WILLOW Sālix interior Rowl.

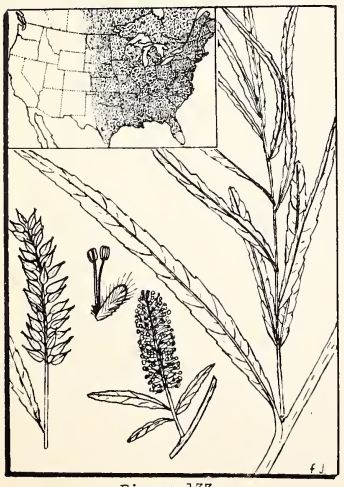


Figure 133

TREE: Shrub or small slender tree; rarely a large tree to 70 ft. high. Along streams.

BARK: Smooth, dark brown slightly tinged with red.

LEAVES: Yellowish-green, stipules small, 2 to 6 in. long.

FLOWERS: Dioecious. Male catkins yellowish, 1 to 2 in. long. Female catkins with 2 stamens to each flower. April and May.

FRUIT: Capsules in catkins containing seed covered with long tangled hairs.

NUMBER: In

USE: Valuable to prevent erosion.

SPECIMEN:

72b Petioles 1/4 in. or longer. 73

73a Twigs bright or reddish-yellow, glabrous. Leaves glaucous beneath. Stamens 2, Fig.134. YELLOW WILLOW Sā'lix vitellī'na L*



Figure 134

TREE: Large tree of rapid growth, freely spreading, to 80 ft. in height.

BARK: Dark gray, rough, with scaly ridges; twigs yellow, brittle at base.

LEAVES: Glabrous, dark green above; whitish beneath, narrowed at base, 2 to 5 in. long, stipules short.

FLOWERS: Dioecious. Narrow cylindric catkins, 2½ to 3 in. long. Early spring.

FRUIT: Light red-brown, in narrow-ovoid capsules. Seeds covered with tangled hairs.

NUMBER: In

USE: Charcoal and fuel, ornamental.

SPECIMEN:

* NOTE: The European White Willow, Sā'lix ă'lba L., is much like the Yellow Willow except in color of its twigs. Both are natives of Europe and much planted here. The Yellow Willow is more common. It is considered by some to be only a variety of the White Willow.

73b Not as in 73a 74

74a Leaves with white pubescence beneath. Stamens 2. Fig.135. BEBB WILLOW Sā'lix bebbiā'na Sarg.



Figure 135

TREE: Shrubby; occasionally to 25 ft. high.

BARK: Olive green or gray with reddish tinge. Thin.

LEAVES: Thick, smooth dull green, bluish or silvery-white beneath with brownish pubescence.

FLOWERS: Dioecious. Catkins yellowish or reddish.

FRUIT: Brown with whitish hairs.

NUMBER: In

USE: Erosion control.

SPECIMEN:

74b Leaves not pubescent below. 75

75a Twigs and staminate catkins purplish (anthers red and yellow). Leaves glaucous beneath. Fig.136.
BASKET WILLOW Sā'lix purpū'rea L.

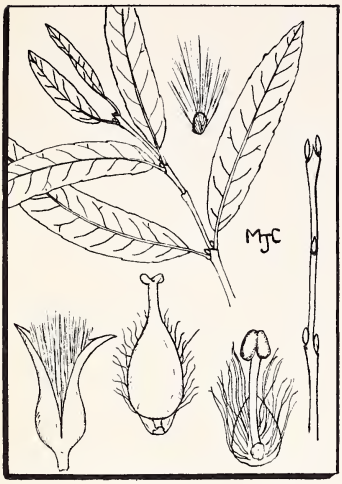


Figure 136

TREE: Slender shrub or small tree; 15 ft. high; twigs flexible and purplish.

BARK: Smooth; dark; very bitter.

LEAVES: 1 to 3 in. long; glabrous, green above and somewhat paler beneath.

FLOWERS: Dioecious. Catkins narrow-cylindrical; small bracts at base, appearing before the leaves; resembling pussy willow but smaller. Male catkins, yellow, red and bluish when in bloom; very showy.

FRUIT: Ovoid-conical capsule, 1/6 in. long, covered with dense wooly hairs.

NUMBER: In

USE: Wickerware and ornamentation.

SPECIMEN:

75b Not as in 75a 76

76a Twigs thick, stout, flower buds very large, reddish. Catkins sessile, appearing before the leaves. Very showy. Fig.137.
GOAT WILLOW Sā'lix cā'prea L.



Figure 137

TREE: Shrub or tree with slender top to 20 ft. high.

BARK: Gray; twigs brown and pubescent when young.

LEAVES: 3 to 6 in. long. Green above; pale tomentose beneath.

FLOWERS: Practically all plants, male, since raised from cuttings. Male catkins appearing before the leaves; very showy.

FRUIT: Female plants seldom if ever raised.

NUMBER: In

USE: Ornamental.

SPECIMEN:

76b Not as in 76a 77

77a Catkins appearing when leaves are well grown. Scales of the flowers persistent. Leaves green above, silvery-white below. Fig.138. PUSSY WILLOW Sālix discolor Muhl.



Figure 138

TREE: Rarely more than 25 ft. high, trunk about 1 ft. in diameter, round topped head.

BARK: Light brown tinged with red.

LEAVES: Dark green above, glaucous white beneath, 2 to 5 in. long.

FLOWERS: Dioecious. Erect catkins 1 to 2 in. long and 1/2 in. in diameter, thickly covered with silky white hairs appearing as fur.

FRUIT: Capsules narrow with long point.

NUMBER: In

USE: Charcoal, Ornamental.

SPECIMEN:

77b Scales of the flowers decidious 78

78a Petioles and stipules with glands. Twigs and leaves shiny. Fig.139. SHINING WILLOW Sālix lūcida Muhl.

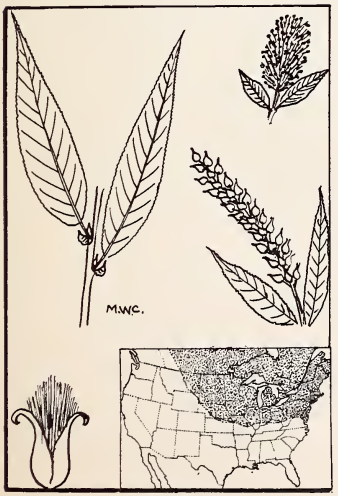


Figure 139

TREE: Shrubby or tree like to 25 ft. high.

BARK: Thin, dark brown.

LEAVES: Shining dark green above; paler with yellowish midrib below. 2 to 6 in. long.

FLOWERS: Dioecious. Catkins erect; stamens 5.

FRUIT: Long acute, retained after liberating the hairy seed.

NUMBER: In

USE: Sometimes planted for ornament.

SPECIMEN:

78b No glands on petioles or stipules 79

79a Twigs very brittle. Stamens 2. Capsules narrow conic. Fig.140. CRACK WILLOW Sālix frăgilis L.



Figure 140

TREE: Well rounded top to 80 ft. high and trunk diameter of 4 ft. Introduced from Europe. Twigs snap off in wind or when handled roughly; float away; take root and thus extend the range widely.

BARK: Gray, scaly.

LEAVES: Dark green above, slightly paler beneath, 3 to 6 in. long; serrations bearing glands.

FLOWERS: Dioecious. Short catkins.

FRUIT: Capsules long, conical.

NUMBER: In

USE: Erosion control. Fuel, charcoal, lumber.

SPECIMEN:

79b Not as in 79a 80

80a Petioles, slender, 1/2 in. or more. Leaves pale beneath. Fig.141. PEACHLEAF WILLOW Sālix amygdaloides Anders.



Figure 141

TREE: Straight or slightly inclining trunk, straight ascending branches. To 70 ft. high.

BARK: Scaly, brown, somewhat tinged with red.

LEAVES: About 1 in. wide and 2 to 6 in. long. Dark green above, paler beneath, stout yellow mid-rib and prominent veins.

FLOWERS: Dioecious. Catkins on leafy branchlets; 2 to 3 in. long; scales yellow. Appear with leaves.

FRUIT: Globose-conic capsules, light reddish-yellow.

NUMBER: In

USE: Wood light; used for charcoal and fuel.

SPECIMEN:

80b Petioles short; leaves lanceolate 81

81a Leaves green on both sides, narrow. Fig.142.
BLACK WILLOW Sā'lix nī'gra Marsh.

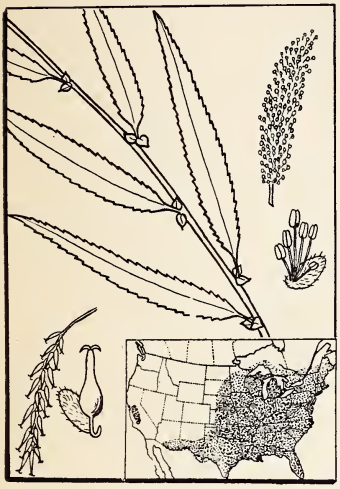


Figure 142

TREE: Largest of the American willows sometimes attaining a height of 120 ft. Trunk 3 or 4 ft. in diameter.

BARK: Trunk rough, thick, flaky, dark brown or nearly black.

LEAVES: 3 to 6 in. long; light green and smooth above, paler and usually smooth beneath.

FLOWERS: Dioecious, yellowish, catkins. April or May.

FRUIT: Capsules in catkins. Seed covered with hairs. Ripens in June and July and is carried long distances by wind.

NUMBER: In

USE: Light wood, fuel, charcoal.

SPECIMEN:

81b Leaves white beneath, wider than 81a. Fig.143.
WARD'S WILLOW Sā'lix lŏn'gipes Shut.



Figure 143

TREE: Shrub or tree to 30 ft. high.

BARK: Dark brown, prominently ridged.

LEAVES: Bright green above; somewhat pubescent and whitish beneath, 4 to 7 in. long.

FLOWERS: Dioecious. Catkins 3 to 4 in. long, scales yellow.

FRUIT: Capsules 1/4 in. long. Seed carried by wind.

NUMBER: In

USE: Fuel.

SPECIMEN:

82a Pith 5 angled in cross section. Fig.144a. 83

82b Pith round or nearly so in cross section. Fig.144b. 91



Figure 144

83a Bundle scars 3 (Fig.145a); teeth on leaf margins gland tipped. 84

83b Bundle scars several, scattered (Fig.145b), no glands on leaves; buds clustered at tip of twigs. THE OAKS See page 55.

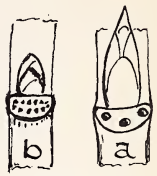


Figure 145

THE POPLARS: Genus PŎPULUS

84a Leaf stem flattened on its sides. 85

84b Leaf stem rounded; not noticeably flattened on sides 90

85a Leaves coarsely toothed; winter buds tomentose or pubescent. Fig.146. LARGETOOTH ASPEN Pŏpulus grandidentāta Michx.


Figure 146

TREE: Narrow round top to 70 ft. high.

BARK: Thin; light grayish-green; dark at base of old trunks.

LEAVES: With few large incurved teeth; dark green above, paler below, 3 to 6 in. long.

FLOWERS: Dioecious. Catkins hairy.

FRUIT: Light green, hairy, ripening early; scattered by wind.

NUMBER: In

USE: Paper, excelsior, wooden ware.

SPECIMEN:

85b Leaves not coarsely toothed 86

86a Tree tall narrow, spire-like; all branches ascending.. Fig.147. LOMBARDY POPLAR Pŏpŭlus ĭtălĭca Moench.



Figure 147

TREE: A spire-like tree of rapid growth with strict ascending branches. Introduced from Europe. To 100 ft. in height; easily told by its shape.

BARK: Dark gray on trunk, light gray on branches. Shallow furrows on trunk; smooth on branches.

LEAVES: Broader than long; shining green.

FLOWERS: Hanging male catkins, 1 to 3 in. long.

FRUIT: Cultivated trees all staminate, bearing no fruit.

NUMBER: In

USE: Ornamental tree. short lived.

SPECIMEN:

86b Tree with spreading limbs; not spire shaped 87

87a Tree slender with smooth greenish-white bark; winter buds glabrous; leaves finely serrate. Fig.148. QUAKING ASPEN Pŏpŭlus tremuloĭdes Michx.



Figure 148

TREE: Round-topped head, slender branches; to 90 ft. high.

BARK: Smooth, greenish-white. Lower trunk rough and darker.

LEAVES: Roundish-heart-shaped, with a short sharp point, smooth on both sides. Flattened petiole. 1½ to 3 in. long.

FLOWERS: Dioecious. Male catkins 1½ to 2½ in. long with soft gray hairs resembling "Pussy Willow", and sometimes confused with it.

FRUIT: Capsules in long catkins. Seeds coated with tangled hair.

NUMBER: In

USE: Light wood, used for paper pulp and excelsior.

SPECIMEN:

87b Buds sticky often angular. Leaves somewhat triangular. . . .88

88a Leaves with glands at apex of leaf stem; rounded or broadly wedge-shaped at base. Buds very resinous. Fig.149.

BALSAM POPLAR Pŏpulus balsamĭfera L.

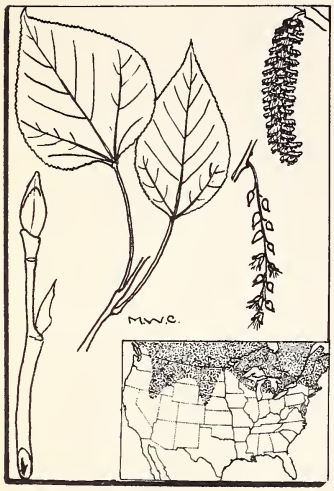


Figure 149

TREE: With narrow pyramidal top to 100 ft. high.

BARK: Gray on old trunk; on younger trees greenish-yellow.

LEAVES: Dark green above; pale beneath with reticulated veins, 3 to 6 in. long.

FLOWERS: Dioecious. Male catkins 1½ to 2 in. long. Female 3 to 3½ in. long.

FRUIT: In catkins 8 to 12 in. long. Seeds light brown.

NUMBER: In

USE: Paper pulp, boxes, etc.

SPECIMEN:

88b Leaves without glands at apex of petiole. 89

89a Young leaves shining; square cut at base with rounded teeth. Main trunk often divided.

EASTERN COTTONWOOD Pŏpúlus deltoĭdes Marsh.

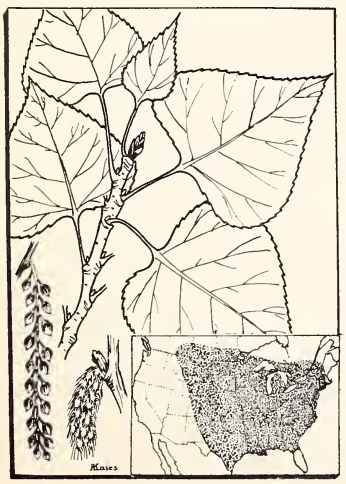


Figure 150

TREE: Largest of the poplars. To 100 ft. high. Trunk 7 or 8 ft. in diameter.

BARK: Grayish-green. Rough. Twigs yellowish-brown.

LEAVES: Glistening. Broadly triangular as the species name indicates. Petiole flattened.

FLOWERS: Dioecious. In catkins 2 to 3 in. long. Male catkins red.

FRUIT: Drooping, in long catkins.

NUMBER: In

USE: Paper pulp, crates, excelsior, fuel and boxes.

SPECIMEN:

89b A hybrid with only staminate catkins; main trunk usually continuing to tree top. Fig.151.

CAROLINA POPLAR Pŏpŭlus canadĕnsis Moench.



Figure 151

TREE: Upright with ascending branches to 90 ft. high. Thought to be a hybrid of the Cottonwood and the Black Poplar.

BARK: Dark brownish-gray on older trunks; yellowish-brown on the large branches.

LEAVES: Yellowish-green somewhat paler beneath; stem flattened; 3 to 6 in. long.

FLOWERS: Male flowers only, as all trees are raised from cutting. Objectionable flying seed is thus avoided.

FRUIT: None. No female trees.

NUMBER: In

USE: Ornamental and shade; fuel.

SPECIMEN:

90a Twigs and under side of leaves with dense white hairs, often lobed. Fig.152.

WHITE POPLAR Pŏpŭlus ălba L.



Figure 152

TREE: Heavy oval top, to 100 ft. high, trunk 2 to 3 ft. in diameter, extensive root system resulting in vigorous sprouting. A native of Europe.

BARK: Rough seamed and heavy. White or light greenish-gray.

LEAVES: Heart-shaped, broad, under surface silvery-white and hairy.

FLOWERS: Catkins, long and drooping eventually 3 to 4 in. long.

FRUIT: Two-valved, oblong capsules in catkins.

NUMBER: In

USE: Ornament and shade.

SPECIMEN:

90b Leaves not lobed, pale or rusty beneath, densely tomentose when young. Buds sticky. Fig.153.

DOWNY POPLAR Pópulus heterophýlla L.

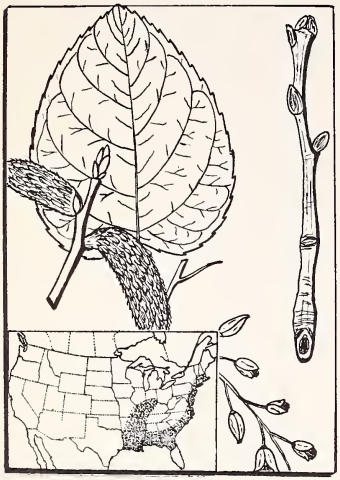


Figure 153

TREE: With open irregular top to 90 ft. high.

BARK: Grayish-brown, prominently furrowed.

LEAVES: When young thickly covered with tangled white hairs, smooth when older. 4 to 8 in. long.

FLOWERS: Dioecious; drooping catkins 2 to 3 in. long.

FRUIT: Ovoid capsules; 2 to 3 valved.

NUMBER: In

USE: Lumber; grayish-brown.

SPECIMEN:

91a With true lateral thorns, fruit small, apple-like; with bony centers when ripe. Fig.154.

THE HAWTHORNS, Crataégus sp.

More than 1200 species of the genus Crataegus have been listed for our country. No two botanists would likely agree on their determinations of the Hawthorns. We are accordingly picturing leaves and fruit of several species and letting it go at that. The names and figures have been taken from Sargent's "Manual of the Trees of North America."

Figure 154--a, Crataégus pruinósa K. Koch; b, Crataégus áshei Sarg.; c, Crataégus scábrida Sarg.; d, Crataégus margarétta Ashe.; e, Crataégus oxyacántha L.; f, Crataégus crus-gálli L.; g, Crataégus apiifólia Michx.; h, Crataégus spathuláta Michx.

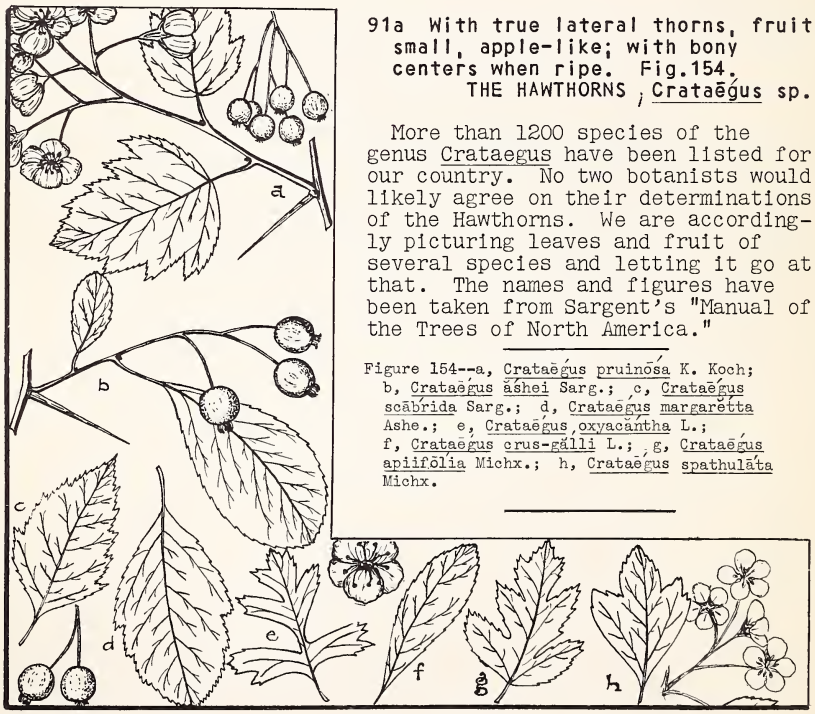


Figure 154

91b Without true lateral thorns (some have dwarfed branches that are thorn-like). 92

92a With stipules or stipular scars 93

92b Without stipules or stipular scars; leaves sour. Fig.155.

SOURWOOD Oxydéndrum arbóreum DC.



Figure 155

TREE: Slender with round top to 60 ft. high.

BARK: Reddish-gray with furrows and appressed scales.

LEAVES: Shining dark green, 5 to 7 in. long. Bright scarlet in the fall.

FLOWERS: In panicles, white, about 1/3 in. long. Mid-summer.

FRUIT: A capsule to 1/2 in. long.

NUMBER: In

USE: Ornamental.

SPECIMEN:

93a Leaves with one or more disk-like, wartlike or toothlike glands at base of blade or on outer end of petiole 97

93b Without glands as mentioned in 93a. 94

94a Glands at tips of serrations on leaf margins. Fruit a spherical berry, about 1/3 in. through, with two to four seeds; black when ripe. Fig.156.

YELLOW BUCKTHORN* Rhámnus caroliniána Walt.

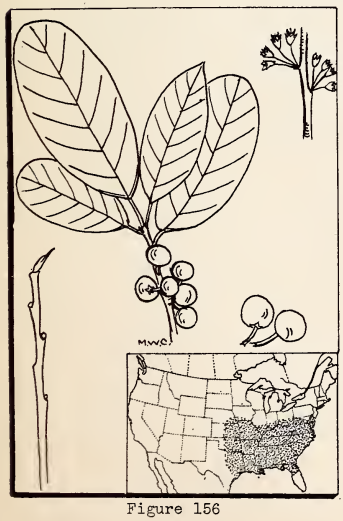


Figure 156

TREE: With spreading branches to 40 ft. high.

BARK: Thin, light gray, with black blotches.

LEAVES: Dark yellow-green above; pale below; 2 to 5 in. long.

FLOWERS: Greenish-white, in umbels.

FRUIT: About 1/3 in. in diameter; black when ripe; with 3 to 4 hard seeds.

NUMBER: In

USE: Ornamental.

SPECIMEN:

* NOTE: The European Buckthorn, Rhámnus cathártica L., has been much planted in some of our regions. Its leaves are less elongate, have only 3 or 4 lateral veins and are opposite on the stem.

94b Serrations not gland tipped. Fruit apple-like. 95

95a Leaves usually dull, irregularly dentate or serrate, sometimes lobed. 96

95b Leaves glabrous and usually shiny, sharply and regularly serrate. Fruit usually pear-shaped. Fig.157.

PEAR Pyrus communis L.

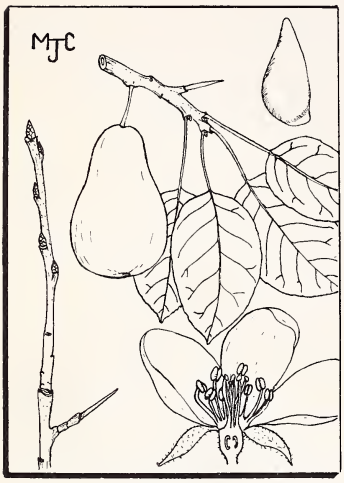


Figure 157

TREE: Sometimes 60 ft. high, trunk 2 to 3 ft. in diameter. Commonly much smaller. Branches sometimes thorny.

BARK: Dark smooth bark.

LEAVES: Shining green, 2 to 4 in. long.

FLOWERS: Borne at the ends of short twigs of the preceding year, 3/4 to 1½ in. broad. White or pinkish.

FRUIT: Many varieties, some delicious.

NUMBER: In

USE: Fruit.

SPECIMEN:

96a Leaves rounded or cordate at the base, fruit of various shapes and colors when ripe. Fig.158. APPLE Malus malus Britt.



Figure 158

TREE: Medium-sized, round-headed with spreading branches; to 40 ft. high.

BARK: Dark grayish-brown, flaky.

LEAVES: Pubescent and often wooly beneath, more or less glabrous above, 3 to 5 in. long.

FLOWERS: White or light pink, 1 to 2 in. across; appearing with foliage or just before it.

FRUIT: Fleshy pome of various varieties due to cultivation.

NUMBER: In

USE: Cultivated for fruit. Wood for tool handles.

SPECIMEN:

96b Leaves rounded at the base. Fruit shiny green, 3/4 to 1½ in. in diameter.* Fig.159. PRAIRIE CRABAPPLE Mălus iowĕnsis Britt.



Figure 159

TREE: Forming dense thickets, from 25 to 30 ft. in height, spreading branches forming an open head.

BARK: Longitudinally fissured, the outer layer separating into long narrow persistent red-brown scales.

LEAVES: Tinged with red, villose pubescent when unfolded; 1 to 2 in. long.

FLOWERS: Beautiful pink, 1-1/4 to 1½ in. in diameter. May-June.

FRUIT: On slender pedicels, green when fully grown; about 1 in. in diameter. Yellowish-green at maturity.

NUMBER: In

USE: Tool handles, fruit used for jellies.

SPECIMEN:

* NOTE: Several species of wild crabs quite similar to this are known. The Siberian Crabapple, Mălus baccăta Borck is often cultivated.

97a Twigs usually red on top and green below although sometimes wholly red or green. Fig.160. PEACH Amўgdalus pĕrsica L.



Figure 160

TREE: Small, 15 to 30 ft. high; not over 1 ft. in diameter. Originally from China.

BARK: Smooth, rather dark. Young twigs usually red on top side and green on other side.

LEAVES: 4 to 7 in. long, tapers equally to both ends; petioles often red.

FLOWERS: Pink, appear before leaves. 1/2 to 2 in. broad, scaly-bracted.

FRUIT: Clothed with velvety down, large stone, wrinkled, diameter 1½ to 3 in., matures Aug. to Oct. There are many varieties including the Nectarines and Flat Peaches.

NUMBER: In

USE: Fruit.

SPECIMEN:

97b Twigs not red or green. Fruit a smooth drupe 98

98a Leaves folded lengthwise in the bud and when emerging; petioles usually rather slender and long; fruit usually small with rounded pits. THE CHERRIES 99

98b Leaves wrapped around each other in the bud and when emerging; petioles tending to be short and stout; fruit usually larger with somewhat flattened pits. THE PLUMS. 103

THE CHERRIES: Genus PRŪNUS

99a Flowers and fruit in axillary umbels (sometimes in corymbs, in pennsylvănica); blossoming with or before the appearance of leaves. Fig.161. 100



Figure 161

99b Flowers and fruit in racemes at end of leafy branches. Fig.162 102

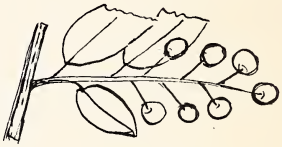


Figure 162

99c Flowers and fruit in terminal corymbs. Fruit about 1/4 in. black when ripe. Fig.163. MAHALEB CHERRY Prūnus māhaleb L.

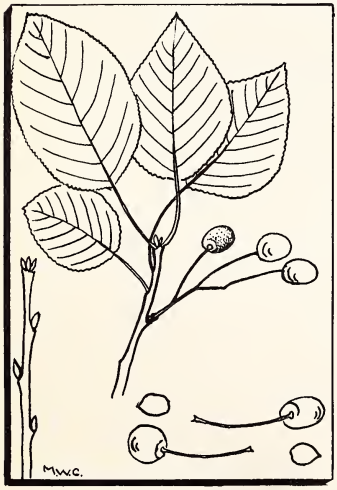


Figure 163

TREE: With rounded top to 25 ft. high. Its fragrant foliage, wood and flowers have given it the name "Perfumed cherry". Native of southern Europe.

BARK: Brownish-gray; rough.

LEAVES: Bright green; 1 to 2 in. long.

FLOWERS: White 1/2 in. across or smaller. May-June.

FRUIT: Dark red when ripe in July; 1/3 in. in diameter.

NUMBER: In

USE: Ornament. Stock for grafting.

SPECIMEN:

100a Fruit usually 1/2 in. or over in length 101

100b Fruit about 1/4 in., very sour. Fig.164.
PIN CHERRY Prūnus pennsylvănica L.f.



Figure 164

TREE: With narrow oblong top to 35 ft. high.

BARK: Smooth purplish-brown. Lenticels very prominent.

LEAVES: Shining green above, paler below, 3 to 6 in. long.

FLOWERS: 1/2 in. across; white.

FRUIT: Light red, 1/4 in. in diameter; tart.

NUMBER: In

USE: Fuel.

SPECIMEN:

101a Leaves glabrous, fruit sour. Fig.165.
SOUR CHERRY Prūnus cĕrasus L.



Figure 165

TREE: Low, spreading, rounded top, to 30 ft. high. Trunk 10 to 12 in. in diameter. Native of Europe.

BARK: Older trees have thin curled scales leaving somewhat ridged inner bark. Dark color. Twigs reddish-brown, smooth with prominent lenticels.

LEAVES: 2½ to 4 in. long, firm and thick, lustrous dark green above, paler beneath.

FLOWERS: White, about one in. broad, appear before or with leaves.

FRUIT: 1/2 in. in diameter (larger in cultivation), red, without bloom, juicy tart flesh with subglobose pit.

NUMBER: In

USE: Fruit.

SPECIMEN:

101b Leaves pubescent on under side, fruit sweet. Fig.166.
SWEET CHERRY Prūnus ăvium L.

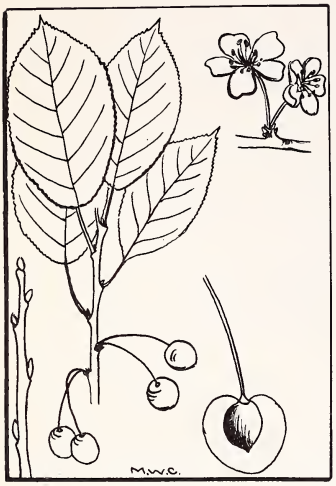


Figure 166

TREE: Wide spreading with age; to 75 ft. high. A native of Europe.

BARK: Smooth, reddish-brown, in layers like the birches.

LEAVES: Dull dark green above usually pubescent beneath, 4 to 6 in. long.

FLOWERS: About 1 in. across, white, appearing with the leaves.

FRUIT: Flesh sweet. Many varieties; yellow to dark red.

NUMBER: In

USE: Fruit. Wood used for furniture and musical instruments.

SPECIMEN:

102a Leaves thickish with incurved teeth, glands on petiole elongated, tooth-like. Fig.167.
WILD BLACK CHERRY Prúnus serŏ́tina Ehrh.

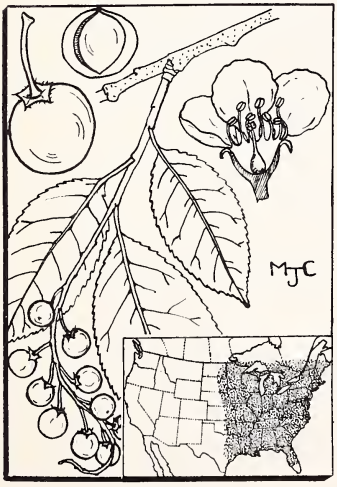


Figure 167

TREE: A large tree with oblong or rounded top. Sometimes attains height of 80 to 100 ft. Branches slender.

BARK: Rough, black and flaky. Branches reddish-brown with prominent lenticels.

LEAVES: 2 to 5 in. long; thickish, serrate with incurved teeth.

FLOWERS: Small and white in long hanging racemes. Usually appear later than flowers of most trees.

FRUIT: Small reddish-black drupes in racemes. Not edible.

NUMBER: In

USE: Valuable wood for interior and cabinet work.

SPECIMEN:

102b Leaves thinish with diverging teeth, glands on petiole usually rounded or disk-like. Fig.168.

CHOKE CHERRY Prūnus virginiāna L.

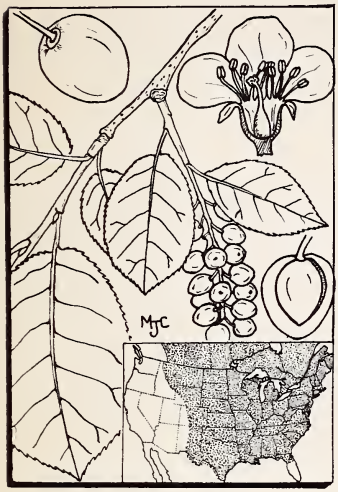


Figure 168

TREE: Irregular rounded top; 20 to 30 ft. high. Crooked or leaning trunk about 6 to 8 in. in diameter.

BARK: Grayish-brown, more or less mottled and rather smooth.

LEAVES: Thin, 2 to 3 in. long, dull dark green above, paler along veins beneath. Teeth somewhat spreading.

FLOWERS: 1/4 to 1/3 in. across in cylindrical racemes, white. May.

FRUIT: A raceme of drupes, almost black when ripe, with a very astringent taste. Kernels poisonous.

NUMBER: In

USE: Fruit for pies and jellies. Wood for vehicle wheels.

SPECIMEN:

103a Flowers and fruit with very short stem; petiole 1/2 as long as leaf blade. Fig.169.

APRICOT Prūnus armeniaca L.



Figure 169

TREE: Small, about 20 ft. high. Rounded top. Originally from China.

BARK: Reddish. Glabrous twigs.

LEAVES: Short-pointed; glabrous above, pubescent on veins beneath. Conspicuous petioles. Dark green.

FLOWERS: Pinkish or nearly white, 3/4 to 1 in. across, single and sessile. Appear before foliage.

FRUIT: One-seeded drupe. Matures in August-September.

NUMBER: In

USE: Fruit used for food.

SPECIMEN:

103b Not as in 103a 104

THE PLUMS: Genus PRŪNUS

104a Leaves abruptly acuminate. Fig.170. 105



Figure 170

104b Leaves not at all or but gradually acuminate 107

105a Leaves dull, usually broad and thick; veins impressed. . .106

105b Leaves shining, firm, glabrous. Fig.171.
WILD GOOSE PLUM Prŭnus hortulāna Bailey

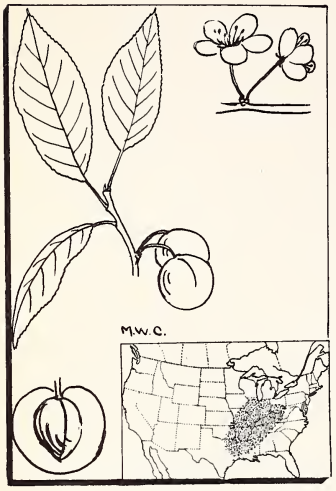


Figure 171

TREE: With spreading branches and rounded top; to 30 ft. high.

BARK: Thin, ridged.

LEAVES: Shining dark green; paler beneath; with glands on serrations and on the petiole near leaf blade.

FLOWERS: 2 to 4 in umbels; about 1 in. across; white appearing when leaves are grown.

FRUIT: Red or reddish-yellow; 1 in. or less long. Several cultivated varieties.

NUMBER: In

USE: Fruit; wood for turning.

SPECIMEN:

106a Leaves sharp serrate; flowers white. Fig.172.
WILD PLUM Prŭnus americāna Marsh.

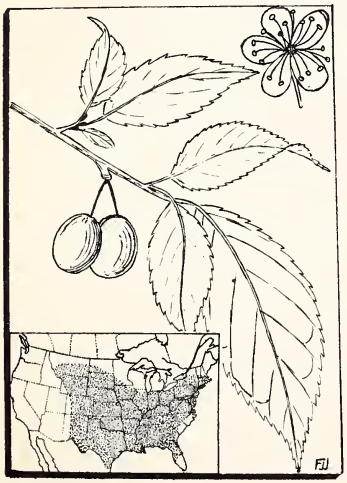


Figure 172

TREE: A shrub or small tree with stunted thorn-like branches to 30 ft. high.

BARK: Thin, dark brown with reddish tinge.

LEAVES: Dark green above; pale and smooth below.

FLOWERS: In umbels of 2 to 5; calyx bright red; petals white, with a claw.

FRUIT: Orange to bright red. 1 in. or less long. Several cultivated varieties.

NUMBER: In

USE: Fruit.

SPECIMEN:

106b Leaves obtusely serrate; flowers turning pink. Fig.173.
CANADA PLUM Prūnus nīgra Ait.

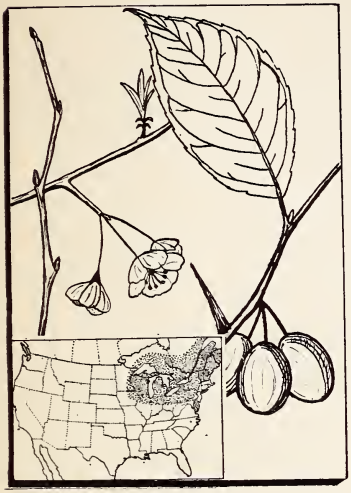


Figure 173

TREE: Top broad and rounded; to 25 ft. high.

BARK: Thin; light grayish-brown; in scales and layers.

LEAVES: At first reddish and pubescent, becoming dull dark green above, under surface paler. Two large glands at apex of petiole.

FLOWERS: 1-1/4 in. across, white turning pink; in umbels; with red stems.

FRUIT: Orange-red when ripe in August; 1 to 1-1/4 in. long. Several cultivated varieties.

NUMBER: In

USE: Fruit.

SPECIMEN:

107a Leaves pubescent beneath but slightly pointed if at all. Cultivated. Fig.174.
EUROPEAN PLUM Prūnus domēstica L.



Figure 174

TREE: Small, strong-growing with thick twigs; maximum height about 35 ft. Many forms due to cultivation. From Asia.

BARK: Dark brown or black, thick.

LEAVES: Simple, serrate, form varying with variety.

FLOWERS: White or cream-color, 1 in. or less across, in small clusters appearing before or with the leaves.

FRUIT: Drupe of various sizes; color and palatibility, variable. Often blue or purple. Covered with whitish bloom.

NUMBER: In

USE: Cultivated for fruit and ornamentation.

SPECIMEN:

107b Leaves glabrous when mature, lanceolate. Fig.175.
CHICKASAW PLUM Prūnus angustifōlia Marsh.

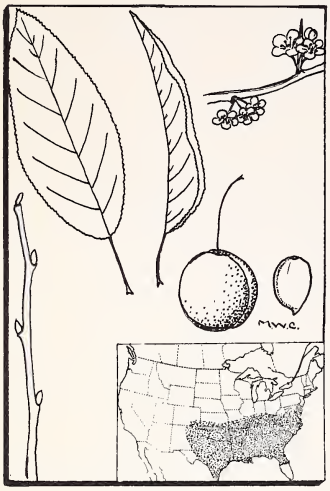


Figure 175

TREE: Spreading branches and round top to 25 ft. high.

BARK: Rough, dark brown.

LEAVES: Shining bright green above; paler beneath; 1 to 2 in. long.

FLOWERS: About 1/3 in. across in 2 to 4 flowered umbels.

FRUIT: Bright red, about 1/2 in. in diameter. Known as "Mountain cherries". Several cultivated varieties are known.

NUMBER: In

USE: Fruit for eating and preserves.

SPECIMEN:

108a Stipules large leaving stipular rings on twig (b); axillary bud wholly covered by base of petiole.* Fig.176.
SYCAMORE Plătanus occidentālis L.

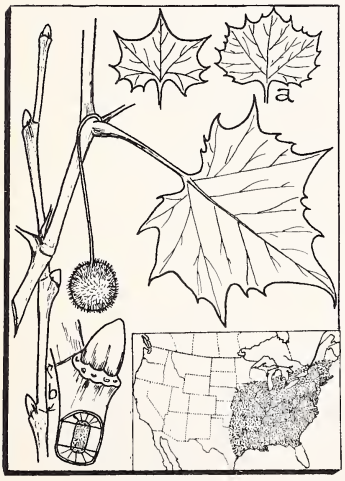


Figure 176

TREE: Heavy, massive spreading limbs free of branches. 140 to 170 ft. high with a trunk diameter of 10 or 11 ft. The largest tree of the eastern and central United States.

BARK: Trunk gray breaking up into small scales. Upper limbs with large peeling scales exposing smooth greenish-white bark.

LEAVES: With large stipules. Yellowish-green; 4 to 8 in. long.

FLOWERS: In hanging balls about 1/2 in. in diameter.

FRUIT: Brown balls 1 in. in diameter, on slender glabrous stems.

NUMBER: In

USE: Boxes, interior finish, furniture. Beautiful when quarter sawed.

SPECIMEN:

* NOTE: The LONDON PLANE, Plătanus acerifōlia Willd. is often planted. The leaves are usually less lobed behind than our native Sycamore. See Fig.176a.

108b Twigs without stipular rings, axillary buds not covered 109

109a Leaves and buds in two rows on the stem 110

109b Leaves not 2 ranked 120

110a Purplish-red flowers appearing before the leaves; leaves heart-shaped, entire. Fig.177. REDBUD Cĕrcis canadĕnsis L.

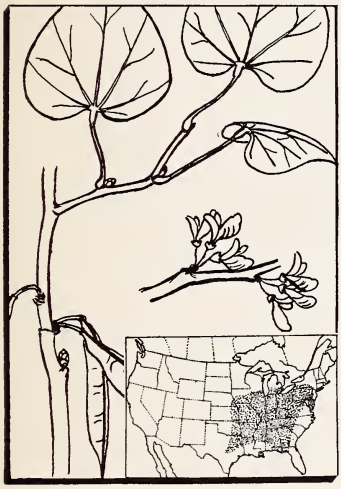


Figure 177

TREE: Small, flat or rounded head, 40 to 50 ft. high. Trunk 10 to 12 in. in diameter.

BARK: Grayish or red-brown, scaly.

LEAVES: 3 to 5 in. long and broad at base, lustrous above, hairy in the axils of the veins beneath, bright yellow in autumn.

FLOWERS: 1/2 in. long in sessile umbels; corolla pink-purple. Appearing before the leaves. April.

FRUIT: Pod 2½ to 3½ in. long; seed oblong, 1/4 in. long.

NUMBER: In

USE: Ornamental, wood of little or no commercial use.

SPECIMEN:

110b Leaves not entire. 111

111a Pith with transverse partitions (see Fig.128b); leaves tapering, sides unequal at base. 112

111b Pith solid, without diaphragms, (see Fig.128a) 113



112a Leaves entire or nearly so. Fig.178.
SOUTHERN HACKBERRY Cĕltis mississippiĕnsis Bosc.



Figure 178

TREE: With spreading and somewhat pendulous branches; to 80 ft. high.

BARK: Pale gray; covered with numerous wart-like roughenings.

LEAVES: Smooth, dark green above; paler below; 1½ to 3 in. long.

FLOWERS: Small yellowish-green; appearing with the leaves.

FRUIT: Drupe 1/8 to 1/4 in. in diameter. Yellow, orange or red when ripe.

NUMBER: In

USE: Fuel, farm purposes, implements and furniture.

SPECIMEN:

112b Leaves sharply serrate, rough. Fig.179.
HACKBERRY Cĕltis occidentālis L.

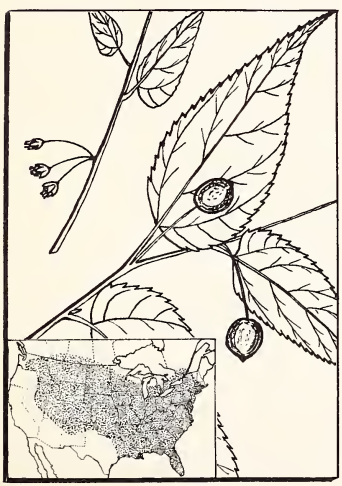


Figure 179

TREE: Medium, oblong top, many small branches, 80 to 100 ft. high. Most specimens contain tangled bunches of twigs known as "witches brooms", a fungus disease.

BARK: Dark gray with characteristic warty appearance, deeply grooved.

LEAVES: Inequilateral, variegated green, covered with parasitic fungus, and insect galls.

FLOWERS: Small, green, appearing with the leaves.

FRUIT: Fleshy, dark purple, sweet, matures in autumn.

NUMBER: In

USE: Manufacture of furniture, fuel, fences.

SPECIMEN:

113a Sap milky. THE MULBERRIES. 114

113b Sap not milky 116

114a Both staminate and carpelate flowers in catkins. Fig.181.
. 115

114b Carpelate flowers in round balls, staminate in catkins. Fig.180. PAPER MULBERRY Broussonētia papyĭfera Vent.

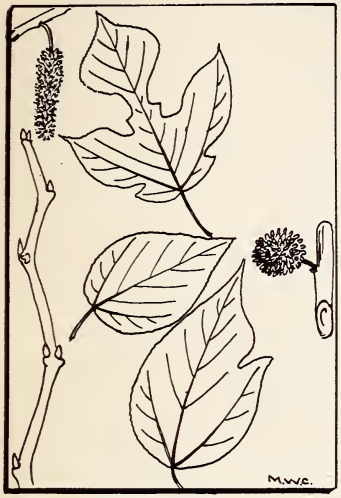


Figure 180

TREE: With wide rounded top; to 50 ft. high. Native of Asia but often growing wild in our country.

BARK: Young trees smooth; old trees much roughened.

LEAVES: Variously lobed or without lobes, rough above, tomentose beneath; 3 to 8 in. long.

FLOWERS: In spherical shaped catkins.

FRUIT: Red; about 3/4 in. across.

NUMBER: In

USE: Ornamental. Wood has little use in our country.

SPECIMEN:

115a Leaves rough above, pubescent beneath. Fig.181.
RED MULBERRY Mōrus rūbra L.



Figure 181

TREE: Round top, with compact foliage. 50 to 70 ft. high, trunk 3 to 4 ft. in diameter.

BARK: Rough and gray; separating in strips.

LEAVES: Large heart-shaped; some of the leaves deeply lobed, hairy beneath in contrast with leaves of white mulberry which are smooth.

FLOWERS: Drooping yellowish-green catkins. May.

FRUIT: Berry-like, long, dark purple, delicious. Ripe in July.

NUMBER: In

USE: Cultivated for fruit. Wood is used for posts, farm implements, in cooperage, as "acid wood" and in ship building.

SPECIMEN:

115b Leaves smooth on both sides; thin.* Fig.182.
WHITE MULBERRY Mōrus ălba L.

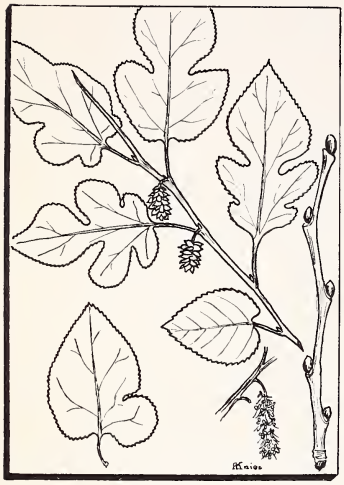


Figure 182

TREE: Spreading, smooth branches, round-topped. 60 to 70 ft. high. Brought from China and Japan to feed silk worms.

BARK: Dark brown tinged with red and divided into irregular elongated plates.

LEAVES: Thin, more or less deeply lobed, occasionally double-serrate. Glabrous beneath in contrast with red mulberry.

FLOWERS: Appear with unfolding of leaves, staminate in a spike 2 to 2½ in. long. Narrow.

FRUIT: Matures in June or July, 1/2 to 1½ in. long. Rather tasteless.

NUMBER: In

USE: Boat-building, fence, cooperage, valuable to attract birds from better fruit.

SPECIMEN:

* NOTE: The BLACK MULBERRY, Mórus nígra L. originally from Persia is also much planted. It is apparently not as hardy as the White Mulberry.

116a Leaf blades unequal in size at their base. Fig.183a 117

116b Leaves symmetrical. Fig.183b.
THE BIRCHES See page 51.



Figure 183



THE BASSWOODS: Genus TĬLIA

117a Leaves wholly glabrous except on veins and in their axils. 118

117b Leaves pubescent or hairy beneath 119

118a Leaves comparatively large, (4 to 6 in. long); with tufts of hairs in axils. Fig.184. BASSWOOD Tilia glabra Vent.



Figure 184

TREE: Large, 60 to 125 ft. high, straight-trunked with spreading branches.

BARK: Light brown, deeply furrowed, inner bark very tough.

LEAVES: Inequilateral, dark dull green above, yellow green below; 5 to 6 in. long.

FLOWERS: Yellowish-white, in drooping clusters, fragrant. May and June.

FRUIT: Berry-like, dry, rounded pod with short thick brownish wool; attached in clusters to leafy bract, which carries them in the wind.

NUMBER: In

USE: Light soft wood used for cabinet work, toys, etc. A valuable honey plant.

SPECIMEN:

118b Leaves comparatively small (1½ to 2½ in. long). Cultivated. Fig.185. SMALL-LEAF LINDEN Tilia cordata Mill.



Figure 185

TREE: Spreading branches, round-headed, grows to 100 ft. in height. Twigs more slender than American Linden.

LEAVES: Often broader than long, unequally cordate at base, dark green above. 1½ to 2½ in. long.

FLOWERS: Yellowish-white, about 1/3 in. across, in nearly upright cymes.

FRUIT: Globose, about 1/4 in. in diameter, tomentose; faintly ribbed, with thin fragile shell.

NUMBER: In

USE: With us, ornamental; a valuable honey plant.

SPECIMEN:

119a Leaves covered with short gray pubescence beneath. Fig.186.
DOWNY BASSWOOD Tĭlia neglĕcta Spach.

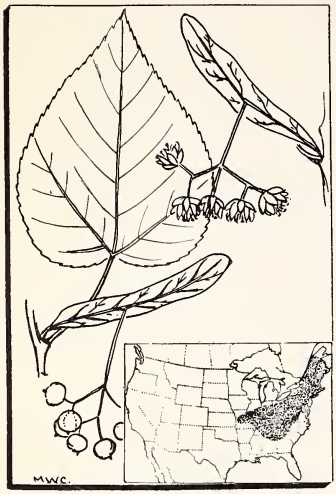


Figure 186

TREE: With broad round head to 90 ft. high.

BARK: Reddish-brown, deeply furrowed.

LEAVES: Thick; dark green and glabrous above; under surface with gray pubescence; 4 to 5 in. long.

FLOWERS: In 5 to 15 flowered cymes. June and July.

FRUIT: Nut-like, spherical, about 1/3 in. in diameter.

NUMBER: In

USE: Cabinet work, toys, etc.

SPECIMEN:

119b Leaves covered with matted hair beneath (white, or sometimes brown on higher branches). Fig.187.
WHITE BASSWOOD Tĭlia heterophўlla Vent.

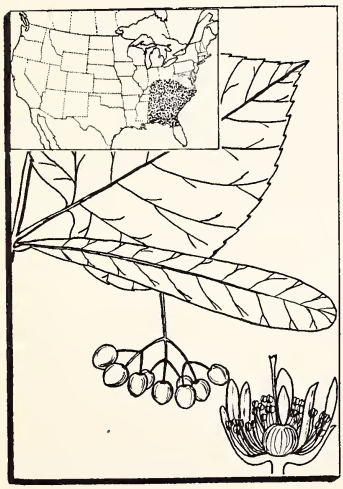


Figure 187

TREE: Large well shaped to 90 ft. high.

BARK: Gray, furrowed.

LEAVES: Dark green and glabrous above, under side covered with brownish or white pubescence; 3 to 5 in. long.

FLOWERS: 10 to 20 in corymb; about 1/4 in. long.

FRUIT: About 1/3 in. long; brownish.

NUMBER: In

USE: Cabinet work, fuel, etc.

SPECIMEN:

120a Leaves entire or two or three lobed; bark and leaves aromatic. SASSAFRAS Turn to Fig.75, page 43.

120b Leaves more or less star-shaped with 3 to 7 narrow radiating lobes. Pith 5 angled. Fig.188.

SWEETGUM Liquidámbar styracíflua L.



Figure 188

TREE: Tall symmetrical, to 120 ft. high.

BARK: 1 in. thick, gray, deeply furrowed; winged on smaller twigs and yellow or yellowish on 1st. year twigs.

LEAVES: Star-shaped, 5 to 7 pointed; glossy dark green turning brilliant red in fall.

FLOWERS: Monoecious. Male flowers in grape-like clusters, green; female in greenish balls.

FRUIT: Numerous pods in a ball-like mass.

NUMBER: In

USE: Ornamental planting. Cabinet work and interior finish.

SPECIMEN:

120c Not as in 120a or 120b. 121

121a Pith 5 angled in cross section, see Fig.144a; leaves usually broad at base. THE POPLARS Turn to page 76.

121b Pith nearly round in cross section; usually with long thorns. HAWTHORNS (See Fig.154, page 81)

122a Pith with brownish cross partitions and short hollow spaces between, (see Fig.128b) 123

122b Pith without diaphragms. See Fig.128a. 125



THE WALNUTS: Genus JUGLANS

123a Leaflets serrate, young twigs pubescent. Nuts rough and thick shelled 124

123b **Leaflets almost entire; twigs glabrous. Nuts thin shelled and fairly smooth. Cultivated. Fig.189.**

ENGLISH WALNUT *Jūglans rēgia* L.



Figure 189

TREE: Broad rounded top to 80 ft. high. Native of Asia.

BARK: Gray with shallow furrows.

LEAVES: Almost wholly without pubescence; leaflets with smooth margins or nearly so.

FLOWERS: Male in catkins; female, small green in groups of 1 to 3.

FRUIT: Nut with thin hull and shell. In many cultivated forms.

NUMBER: In

USE: Nuts.

SPECIMEN:

124a **Fruit in long racemes covered with viscid hairs. Leaflets 11 to 17 densely serrate. Cultivated. Fig.190.**

JAPANESE WALNUT *Jūglans sieboldiāna* Maxim.

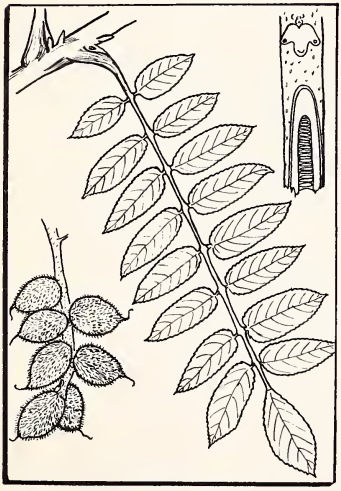


Figure 190

TREE: Broad top to 50 ft. high.

BARK: Brownish gray moderately furrowed.

LEAVES: With 11 to 17 leaflets; smooth above, usually glandular pubescent beneath 8 to 15 in. long.

FLOWERS: Male in hanging catkins; female small green in racemes.

FRUIT: In long racemes of 8 to 20. Thick shelled.

NUMBER: In

USE: Edible nuts.

SPECIMEN:

124b Fruit solitary or in pairs, almost spherical. Leaflets 15 to 23. Bark of larger limbs dark and rough. Fig.191.

BLACK WALNUT Juglans nigra L.



Figure 191

TREE: Symmetrical rounded top; to 150 ft. high; trunk 4 to 6 ft.

BARK: Dark brown and prominently ridged. Upper branches dark.

LEAVES: 12 to 28 in. long, 13 to 23 leaflets, glabrous above, pubescent beneath.

FLOWERS: Catkins, 2 to 4 in. long. May or June.

FRUIT: Solitary or in clusters of 2 to 3, light yellow-green; nut, oval, edible.

NUMBER: In

USE: Furniture, gunstalks, interior finishings. One of our most valuable woods. Food.

SPECIMEN:

124c Fruit elongate, in compact clusters of 3 to 5, coated with rusty sticky hairs. Leaflets 11 to 17. Bark of larger limbs with smooth light areas. Fig.192. BUTTERNUT Juglans cinerea L.

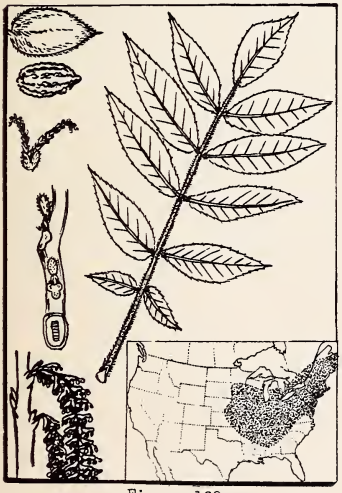


Figure 192

TREE: Round top. Spreading branches, 50 to 80 ft. high. Usually forked and crooked trunk.

BARK: Dark gray on trunk. Smooth light colored patches on large branches and velvet pads at top of leaf scars distinguish it from the black walnut.

LEAVES: 7 to 17 leaflets. Hairy.

FLOWERS: Male flower in long yellow-green drooping catkins. The female with red-fringed stigmas.

FRUIT: An elongated nut, clammy, pointed. Kernel oily and edible.

NUMBER: In

USE: Wood for interior finish and furniture. Cultivated for fruit. Shells of nuts yield a yellow dye.

SPECIMEN:

125a Leaves evenly pinnate (a) or doubly pinnate (b), axillary buds superposed. Fig.193a and b . . . 126

125b Leaves odd pinnate (c), odd-bipinnate (d) or with only three leaflets (e). Fig.193c,d and e. . . 128



Figure 193

126a Usually with large sharp pointed thorns, pith small . . .127

126b No thorns. Pith large. Fig.194.
KENTUCKY COFFEETREE Gymnŏcladus dioĭca Koch.



Figure 194

TREE: Rounded top, very coarse branches. 80 to 100 ft.

BARK: Dark gray, deeply fissured. Early twigs hairy.

LEAVES: Twice pinnately compound. Some very large.

FLOWERS: Staminate, in clusters 2-3/4 to 4 in. long, pistillate in racemes 4 to 12 in. long.

FRUIT: Pod 4 to 10 in. long, 1½ to 2 in. broad, remain until late winter. Seeds large and heavy.

NUMBER: In

USE: Furniture, posts. Seeds formerly used for coffee.

SPECIMEN:

127a Fruit a many seeded pod 12 to 18 in. long. Fig.195.
HONEY LOCUST Gleditsia triacănthos L.



Figure 195

TREE: Large, handsome, spreading; to 140 ft. high. Large branching thorns. (Some trees lack thorns).

BARK: Dark gray with thin scales.

LEAVES: Pinnate, fern-like, or twice pinnate consisting of 18 to 28 leaflets, or 4 to 7 pairs of secondary leaflets. Dark green; yellow in autumn.

FLOWERS: Polygamous; greenish, not conspicuous. May and June.

FRUIT: Pod 10 to 18 in. long; flat and often twisted. Dark brown when ripe. Flattened bean-like seeds. Sweet.

NUMBER: In

USE: For shade, ornament, and hedge. fence posts, cross ties.

SPECIMEN:

127b Fruit a short 1 to 3 seeded pod 4 to 5 in. long. Fig.196.
WATER LOCUST Gleditsia aquatica Marsh.

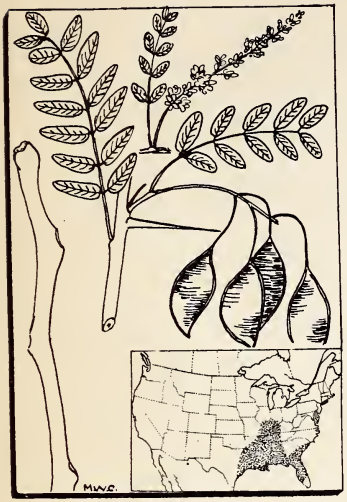


Figure 196

TREE: Short trunk with heavy spreading branches; to 60 ft. high.

BARK: Thin, dull gray to brown, with small scales.

LEAVES: With 12 to 22 leaflets or bipinnate with 3 to 4 pairs of pinnae.

FLOWERS: Greenish in slender racemes.

FRUIT: Pods (usually single seeded) 1 to 2 in. long and 1 in. wide arranged in racemes.

NUMBER: In

USE: Fuel and fence posts.

SPECIMEN:

128a Prominent glands at tip of teeth on base of leaflets. Leaves have disagreeable odor. Fig.197.
TREE OF HEAVEN Ailanthus altissima Swingle

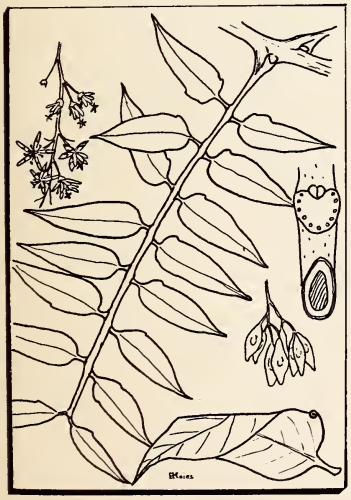


Figure 197

TREE: Medium, oval top to 100 ft. high. Rapid growing.

BARK: Gray, thin, rough; young twigs green.

LEAVES: Pinnately compound, 12 to 40 in. long. One or more glands on each leaflet.

FLOWERS: Yellowish-green in large panicles. Staminate flowers emit foul odor. June.

FRUIT: Broad winged, spirally twisted, 1½ in. long. Seed in center.

NUMBER: In

USE: Ornamentation; leaves used in China for feeding silk worms. Wood used for fuel or cabinet making.

SPECIMEN:

128b Not as in 128a. 129

129a Leaves odd twice pinnate, up to 4 ft. long. Thorns on twigs and leaves. Fig.198. HERCULES-CLUB Arālia spinōsa L.



Figure 198

TREE: Small, sparsely branched, shrub-like to 30 ft. high. Thick twigs.

BARK: Gray-straw colored, interspersed with stout spines or prickles. Young twigs round, very stout.

LEAVES: Twice pinnate, 3 to 4 ft. long, 2½ ft. wide, clustered at the ends of branches. Five or six pairs of lateral leaflets. Dark green above, pale beneath.

FLOWERS: White, 1/16 in. long, appearing at midsummer in large panicles.

FRUIT: Black, 1/8 in. in diameter, 3 to 5 angled, purple, very juicy flesh. Seeds oblong, 1/10 in. in diameter. Ripens in autumn.

NUMBER: In

USE: Berries and bark of the roots used in medicine. Ornamental tree.

SPECIMEN:

129b Not as in 129a. 130

130a Leaves with 3 leaflets. Fig.199. HOPTREE Ptēlea trifoliāta L.

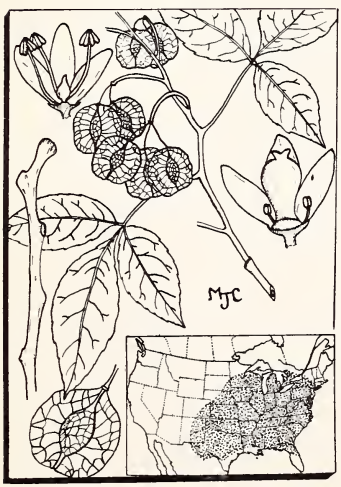


Figure 199

TREE: Small, round headed tree or shrub, 20 to 25 ft. high, slow growing.

BARK: Smooth, thin, bitter, branchlets covered with fine pubescence.

LEAVES: 3 leaflets (rarely 5), finely serrate, 2 to 3 in. long, green, turn clear yellow in fall.

FLOWERS: Small, greenish white, June.

FRUIT: Thin obovate wings, 1 in. or less in diameter. Dark brown, in clusters.

NUMBER: In

USE: Bark of the roots used to make tinctures and extracts. Fruit sometimes used to replace hops in beer making. Ornamentation.

SPECIMEN:

130b Simple pinnate leaves with more than 3 leaflets 131

131a Leaves with stipules. 132

131b Leaves without stipules 136

132a Leaflets entire or with wavy margin 133

132b Leaflets with sharp serrations. Buds sticky in winter. .135

133a Branches usually with stipular thorns. Leaflets 9 to 21. Fig.200 134



Figure 200

133b Branches without thorns. Bark of tree smooth. Leaflets 7 to 11. Fig.201. YELLOWWOOD Cladrăstis lūtea Koch.

TREE: Broad top, graceful; to 60 ft. high.



Figure 201

BARK: Thin, smooth, beech-like. Shows inner bark in delicate light streaks as the outer bark becomes fissured.

LEAVES: Pinnately compound. Dark green leaflets. 8 to 12 in. long, turning bright yellow in autumn.

FLOWERS: Pea shaped, hanging in long stems. Pure white delicately marked with yellow.

FRUIT: A small pod, bean-like, hanging in clusters.

NUMBER: In

USE: Cultivated for shade and ornament. The heart wood yields a valuable dye.

SPECIMEN:

134a Pods, twigs and leaf stems smooth; flowers white. Fig.202.
BLACK LOCUST Robinia pseudoacacia L.



Figure 202

TREE: With narrow oblong head to 100 ft. high.

BARK: Dark brown, very rough, dividing into strips as tree grows older.

LEAVES: 7 to 19 leaflets, dark green, smooth and entire; 8 to 14 in. long.

FLOWERS: White or yellowish, fragrant, in drooping racemes, 4 to 7 in. long. Calyx short, 5 toothed, slightly 2-lipped. May, June.

FRUIT: Glabrous pod from 3 to 5 in. long containing 4 to 8 small hard seeds.

NUMBER: In

USE: Posts, railroad ties, wagon hubs, furniture and in ship building. Much planted in erosion control.

SPECIMEN:

134b Twigs and leaf stems with glands; pods sticky; flowers reddish. Fig.203.
CLAMMY LOCUST Robinia viscosa Vent.



Figure 203

TREE: With slender spreading branches; to 40 ft. high.

BARK: Dark brown, smooth; twigs reddish-brown, covered with glandular hairs.

LEAVES: 11 to 21 leaflets; dark green above, white pubescent below; petiole with glandular hairs; 7 to 12 in. long.

FLOWERS: Reddish or flesh colored, 2/3 in. long in racemes.

FRUIT: A pod 2 to 3½ in. long; covered with sticky hairs; seeds reddish-brown, mottled.

NUMBER: In

USE: Ornamental.

SPECIMEN:

135a Leaflets glabrous above. Fig.204.
AMERICAN MOUNTAIN-ASH Sŏrbus americāna Marsh.



Figure 204

TREE: Slender, well formed to 30 ft. high.

BARK: Light gray broken into small scales.

LEAVES: 5 to 9 in. long. Leaflets 9 to 17, dark green above, pale beneath. Petioles green or reddish.

FLOWERS: In large clusters, white. 1/8 in. across.

FRUIT: Globular, 1/4 to 1 in. in diameter; bright orange-red.

NUMBER: In

USE: Ornamental. Wood but little used.

SPECIMEN:

135b Leaflets pubescent on both sides. Fig.205.
EUROPEAN MOUNTAIN-ASH Sŏrbus aucupāria L.



Figure 205

TREE: With rounded head; to 50 ft. high.

BARK: Smooth, gray.

LEAVES: 9 to 15 leaflets, usually pubescent beneath. 5 to 10 in. long.

FLOWERS: 1/3 in. across; in cymes 4 to 6 in. across; white.

FRUIT: Bright red remaining through the winter.

NUMBER: In

USE: Ornamental.

SPECIMEN:

136a Branches with short thorns. 137

136b Branches without thorns or prickles 138

137a Flowers and fruit in axils. Leaflets 5 to 11. Fig.206.
NORTHERN PRICKLY-ASH Xanthoxylum americanum Mill.

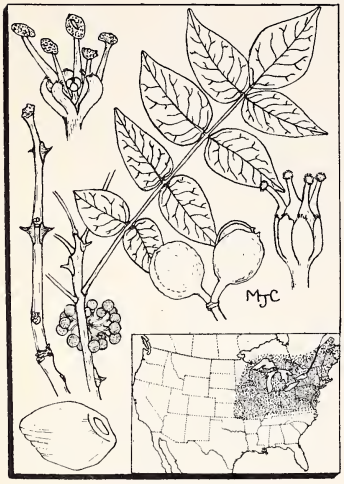


Figure 206

TREE: Shrub or small tree; to 25 ft. high.

BARK: Light greenish-gray, smooth twigs with stipular, stout thorns.

LEAVES: Leaflets 3 to 11, opposite, dark green above, lighter beneath.

FLOWERS: Greenish-yellow, small, appear before leaves. April-May.

FRUIT: Small fleshy pods with shining black seeds. Red when ripe.

NUMBER: In

USE: Wood of little value. Resin from bark used in medicine.

SPECIMEN:

137b Flowers and fruit in large terminal panicles. Leaflets 5 to 17. Fig.207. HERCULES CLUB Xanthoxylum clava-herculis L.

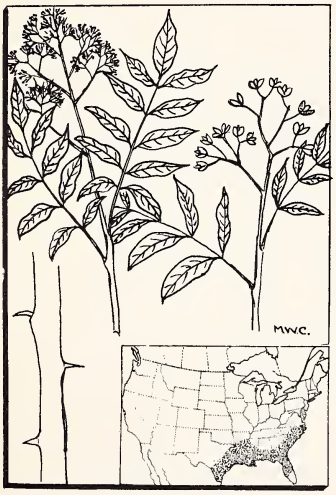


Figure 207

TREE: With short trunk and rounded head to 40 ft. high. In sandy soil.

BARK: Thin, light gray, rough.

LEAVES: With 7 to 15 leaflets shining green above, paler below. 5 to 8 in. long.

FLOWERS: Dioecious 1/8 to 1/4 in. across in cymes 4 to 5 in. long, greenish.

FRUIT: Ripening in spring or early summer, small brown capsule.

NUMBER: In

USE: Medicine.

SPECIMEN:

138a Fruit a nut covered with shell of 4 valves 3/4 in. or larger. THE HICKORIES 142

138b Flowers and fruit in panicles; individual fruit 1/2 in. or less in diameter. Fig.208. 139

139a Two halves of leaflets symmetrical or nearly so 140

139b Leaflets entire, one side noticeably wider than other side. Fig.208. WESTERN SOAPBERRY Sapĭndus drummŏndii H&A.



Figure 208

TREE: With erect branches to 45 ft. high. Often shrub-like.

BARK: Thin reddish-brown, broken into plates. Twigs yellow-green with lenticels showing plainly.

LEAVES: With 9 to 17 leaflets. Smooth above, pubescent below.

FLOWERS: White in panicles 6 to 9 in. long.

FRUIT: Ripening late; yellow, hanging on tree through winter.

NUMBER: In

USE: Basket making, etc.

SPECIMEN:

THE SUMACS: Genus RHŬŚ

140a Flowers and fruit in slender axillary panicles; leaflets 7 to 13. Fig.209. POISON SUMAC Rhŭs vĕrnix L.



Figure 209

TREE: With wide open top to 25 ft. Highly poisonous.

BARK: Thin, light gray.

LEAVES: With 7 to 13 leaflets, dark green above, paler below. Very brilliant in fall; 7 to 14 in. long.

FLOWERS: 1/8 in. across in open panicles, yellowish-green.

FRUIT: Shining white or yellow tinted.

NUMBER: In

USE: Medicine; varnish.

SPECIMEN:

140b Flowers and fruit in terminal panicles. Fig.210. 141

141a Branches and leaf stalks thickly covered with velvety hair; leaflets 11 to 31, pale on under side. Fig.210.
STAGHORN SUMAC Rhŭs typhīna Tor.

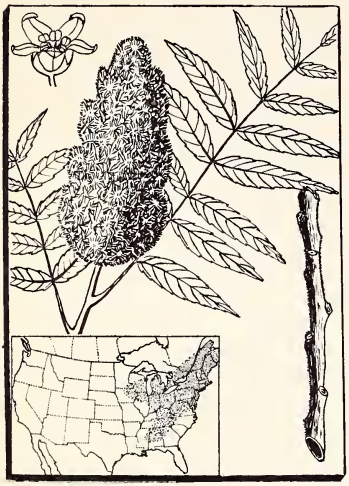


Figure 210

TREE: Shrub or tree to 40 ft. high. Branches thickly covered with long soft brown hairs.

BARK: Thin, smooth, dark brown.

LEAVES: With 11 to 35 leaflets, dark green above, nearly white beneath. Turning to brilliant shades in autumn.

FLOWERS: Greenish-yellow in dense panicles.

FRUIT: In panicles 6 to 9 in. long. Brownish-red.

NUMBER: In

USE: Leaves and bark used in tanning leather.

SPECIMEN:

141b Branches and leaf stalks pubescent; leaflets 9 to 21, green below. Fig.211.
DWARF SUMAC Rhŭs copallīna L.

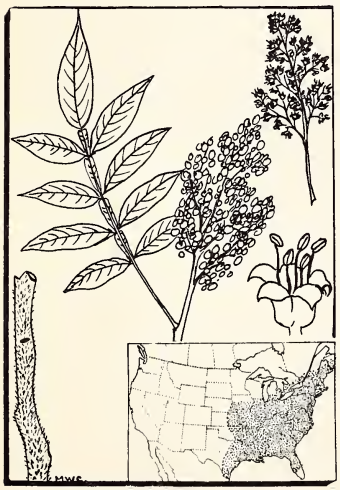


Figure 211

TREE: With spreading branches to 30 ft. high.

BARK: Separating into papery scales; light brown.

LEAVES: 9 to 21 leaflets shining dark green above; pale, pubescent beneath. 6 to 8 in. long.

FLOWERS: Dioecious, in rather open panicles, greenish-yellow.

FRUIT: About 1/8 in. across; red when ripe.

NUMBER: In

USE: Dying and tanning.

SPECIMEN:

THE HICKORIES: Genus CĀRYA

142a Bud scales few (6 or less), not overlapping; leaflets 7 to 15 144

142b Bud scales more than 6, overlapping; leaflets 3 to 9. . .143

143a Nut smooth, husk splitting to base. Leaflets 9 to 13. Fig.212.

WATER HICKORY Cārya aquātica Nutt.

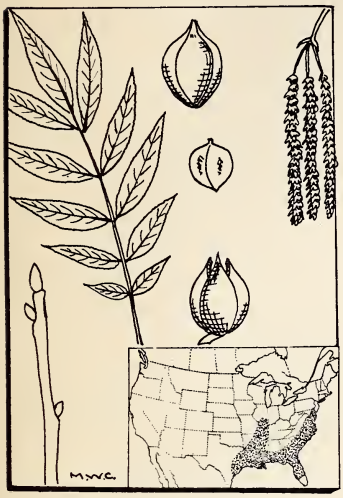


Figure 212

TREE: Slender upright to 100 ft. high.

BARK: Light brown separating into loose scales.

LEAVES: With 7 to 13 leaflets; dark green above.

FLOWERS: Male in yellowish catkins. Female small, several in a spike.

FRUIT: Very much flattened. Seed very bitter.

NUMBER: In

USE: F[illegible]l.

SPECIMEN:

143b Nut angled, husk splitting only about half way to base. Leaflets 7 to 11. Fig.213.

BITTERNUT HICKORY Cārya cordiformis Koch.



Figure 213

TREE: 90 to 100 ft. high, found in low wet places, spreading, broad well shaped head.

BARK: Light brown tinged with red, plate-like scaled surface. Not peeling. Terminal buds yellow.

LEAVES: 6 to 10 in. long. 7 to 9 leaflets, dark yellowish-green.

FLOWERS: Male, in catkins 3 to 4 in. long, yellow, coated with hairs. Female, small, green.

FRUIT: With thin husk, narrowly six ridged; nut globular, thin walled, bitter.

NUMBER: In

USE: Hoops, handles, fuel.

SPECIMEN:

144a Nut somewhat flattened on sides, bitter 145

144b Nut cylindric, edible. Leaflets 9 to 17. Fig,214.
PECAN Cărya pecăn E&G.

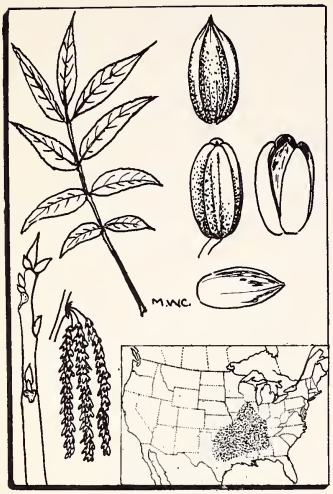


Figure 214

TREE: The largest of the hickories, sometimes 160 ft. high and 5 or 6 ft. in diameter.

BARK: Light reddish-brown, roughened with forked ridges.

LEAVES: 12 to 20 in. long with 9 to 17 leaflets, dark yellow-green.

FLOWERS: Male catkins, yellowish-green, 3 to 5 in. long; female, in few to many flowered spikes.

FRUIT: In clusters of 2 to 11.

NUMBER: In

USE: Wood for fuel and implements. Nuts. Many cultivated varieties.

SPECIMEN:

145a Husk of fruit thick completely splitting into sections; terminal bud 1/2 to 1 in. long. 146

145b Husk thin incompletely splitting; terminal bud 1/4 to 1/2 in. long. 148

146a Bark not shaggy, rough. Nuts thick shelled reddish-brown, often long pointed. Fig.215.
MOCKERNUT HICKORY Cărya ălba Koch.



Figure 215

TREE: With wide topped head to 100 ft. high.

BARK: Gray scaly, with shallow ridges.

LEAVES: With 5 to 7 leaflets shining dark yellow-green. 8 to 12 in. long.

FLOWERS: Monoecious. Male catkins, pale yellow 4 to 5 in. long; female flowers, 2 to 5 in. spikes.

FRUIT: With thick hull and brownish nut, sweet.

NUMBER: In

USE: Implement handles, fuel and nuts.

SPECIMEN:

146b Bark shaggy, in long loose plates; nuts whitish 147

147a Leaflets usually 7 to 9; nut pointed at base, shell thick.
Fig.216. BIG SHELLBARK HICKORY Cārya laciniōsa Loud.

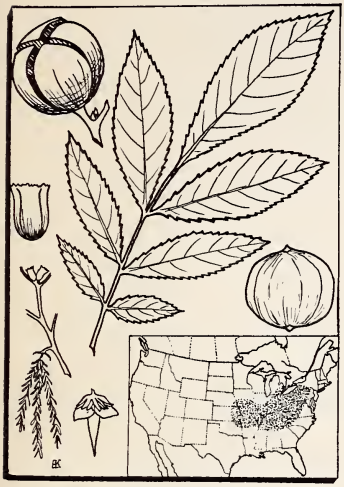


Figure 216

TREE: With narrow open top; to 100 ft. high.

BARK: Light gray; scaling from tree in long thick plates.

LEAVES: With 5 to 9 leaflets, shining dark green; 15 to 20 in. long.

FLOWERS: Male catkins, yellow 5 to 8 in. long; female, in spikes of 2 to 5 flowers.

FRUIT: Husk thick, nut brownish 1-1/4 to 2½ in. long, sweet.

NUMBER: In

USE: Tool handles, etc.

SPECIMEN:

147b Leaflets usually 3 to 5; nut rounded at base, shell thinner.
Fig.217. SHAGBARK HICKORY Cārya ovāta Koch.

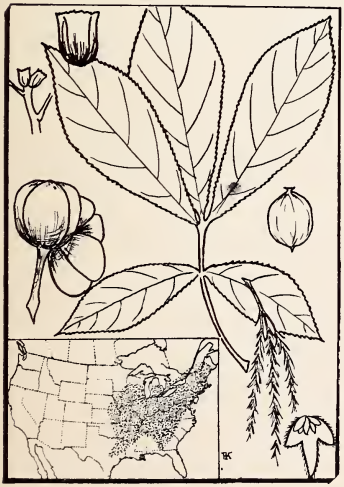


Figure 217

TREE: Large, handsome, 60 to 100 ft. high.

BARK: Light gray, shaggy, separating and hanging in long thick plates.

LEAVES: 5 to 7 leaflets, lower pair smaller. 8 to 14 in. long.

FLOWERS: Male catkins, in 3's; 4 to 5 in. long, open after leaves have attained full size; female, in spikes, reddish-brown.

FRUIT: Globular, thick husk, deeply grooved at seams; nut white, thin-shelled, sweet.

NUMBER: In

USE: Hickory nuts for market; wood for agricultural implements, carriages and wagons; very good fuel.

SPECIMEN:

148a Leaflets 5, rarely 7. Nut thick shelled. Fig.218.
PIGNUT HICKORY Cārya glābra Sweet.

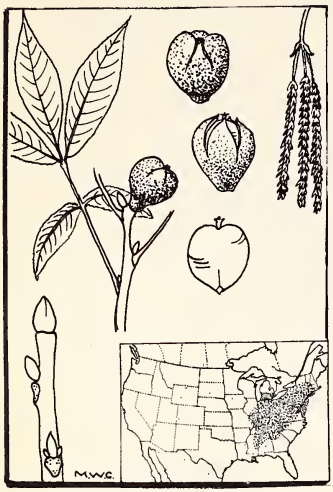


Figure 218

TREE: With spreading or drooping branches; to 90 ft. high.

BARK: Ridged, light gray.

LEAVES: With 5 or 7 leaflets. Yellow-green, 8 to 12 in. long, smooth above.

FLOWERS: Monoecious. Male catkins, yellow, about 2 in. long; female in small spikes.

FRUIT: Thick husk; nut small.

NUMBER: In

USE: Tool handles and fuel.

SPECIMEN:

148b Leaflets 7. Bark often somewhat scaly. Nut usually thin shelled. Fig.219.
SMALL PIGNUT Cārya ovālis Sarg.

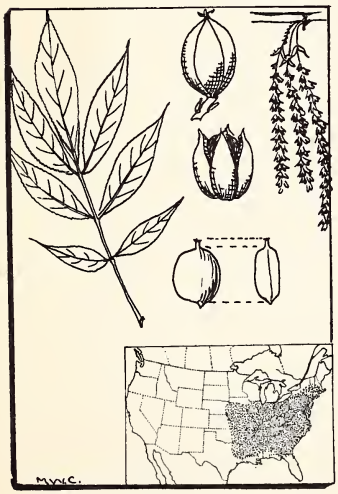


Figure 219

TREE: With pyramidal head; to 100 ft. high.

BARK: Pale gray, usually close and slightly ridged.

LEAVES: 6 to 10 in. long.

FLOWERS: Male catkins, yellow, 6 to 7 in. long. Female, in 1's or 2's.

FRUIT: Husk thin; nut pale.

NUMBER: In

USE: Manufacture of implements, tool handles, etc. Fuel.

SPECIMEN:

149a Leaves simple 150

149b Leaves compound 168

150a Leaves with palmate lobes. Fruit a 2-winged "key". Fig.220 151

150b Leaves without lobes. 159



Figure 220

THE MAPLES: Genus ÁCER

151a Lobes of leaves not serrate 156

151b Lobes of leaves with serrations 152

152a Not as in 152b. 153

152b Leaves as pictured; when young with brown pubescence beneath; twigs green with dark stripes. Fig.221.

STRIPED MAPLE Ácer pennsylvánicum L.

TREE: Slender; to 40 ft. high.



Figure 221

BARK: Thin, reddish-brown; on young twigs greenish-yellow, turning to reddish-brown the first winter.

LEAVES: Thin, pale green 5 to 6 in. long.

FLOWERS: Brilliant yellow in drooping racemes.

FRUIT: Winged, in pairs about 2 in. from tip to tip.

NUMBER: In

USE: Ornamental tree.

SPECIMEN:

153a Flowers appearing earlier than the leaves 154

153b Leaves appearing earlier than the flowers 155

154a Flowers without petals; young fruit hairy. Fig.222.
SILVER MAPLE Acer saccharinum L.

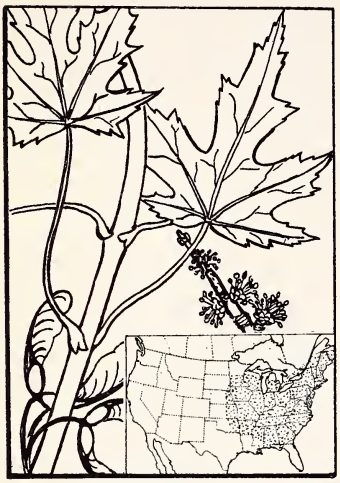


Figure 222

TREE: Heavy, spreading, several main branches, 100 to 120 ft. high.

BARK: Smooth and gray on young trees, rougher and darker on older parts, breaking up into scales.

LEAVES: Five lobed, lobes plainly toothed, under side whitish; 6 to 8 in. long.

FLOWERS: Sessile, numerous, small, reddish, appearing before the leaves.

FRUIT: Winged, largest of our maples, ripens early.

NUMBER: In

USE: A favorite shade tree of rapid growth. Sap used for syrup and sugar.

SPECIMEN:

154b Flowers with reddish petals; young fruit glabrous. Fig.223.
RED MAPLE Acer rūbrum L.

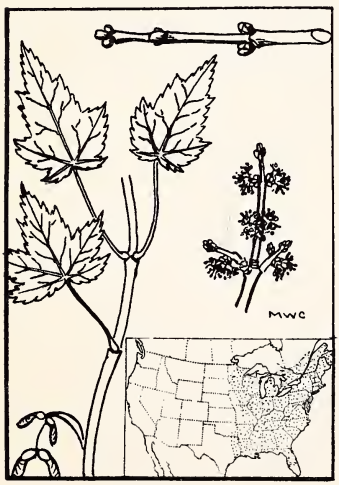


Figure 223

TREE: Heavy, oval or rounded top, several main branches, 100 to 120 ft. high. Trunk 3 to 4½ ft. in diameter.

BARK: Dark gray, flaky or smoothish.

LEAVES: 2 to 6 in. long, 3 to 5 lobed, green above, whitish beneath, turning scarlet in early fall.

FLOWERS: Red or yellowish, appearing before leaves, individual flowers on long pedicels.

FRUIT: Winged, on stems 3 to 4 in. long, ripens early.

NUMBER: In

USE: Shade, lumber, syrup and sugar.

SPECIMEN:

155a Shrub or small tree with greenish twigs. Fig.224.
MOUNTAIN MAPLE Acer spicātum Lam.



Figure 224

TREE: Shrub or small bushy tree to 30 ft. high.

BARK: Usually smooth; thin reddish-brown.

LEAVES: 4 to 5 in. long; turning to brilliant reds and yellows in autumn.

FLOWERS: Monoecious. Male at tip and female nearer base of slender raceme; yellow, pubescent.

FRUIT: Red or yellow when mature, turning brown when ripe.

NUMBER: In

USE: Ornamental planting.

SPECIMEN:

155b Large tree; leaves pubescent beneath, their petioles red; wings of fruit pubescent. Fig.225.
SYCAMORE MAPLE Ācer pseūdo-plătanus L.



Figure 225

TREE: With spreading top; to 70 ft. high. A native of Europe and Western Asia.

BARK: Dark gray.

LEAVES: 4 to 9 in. long, green above, pale and glaucous beneath. Many cultivated varieties with leaves of different colorings and markings.

FLOWERS: In hanging racemes, long stamens.

FRUIT: Keys with wings about at right angles, glabrous.

NUMBER: In

USE: Ornamental.

SPECIMEN:

156a Leaves often with large stipules; green and usually pubescent beneath. Fig.226. BLACK MAPLE Acer nigrum Michx.f.

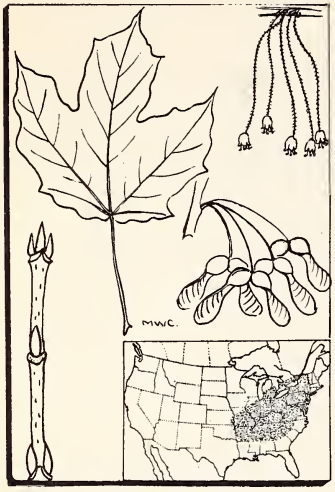


Figure 226

TREE: With rounded top; to 80 ft. high.

BARK: Deeply furrowed, scaly, dark.

LEAVES: 5 to 7 in. long, dull green above, yellow-green and pubescent beneath especially along the yellow veins.

FLOWERS: On slender pubescent pedicels 2 to 3 in. long; yellow.

FRUIT: Usually with converging wings, glabrous.

NUMBER: In

USE: Interior finish, furniture, and various manufacturing purposes. Sugar.

SPECIMEN:

156b No stipules 157

157a Petioles with milky sap; leaves firm and smooth usually wider than long; fruit and flowers as pictured. Fig.227. NORWAY MAPLE Acer platanoides L.



Figure 227

TREE: Medium size with broad rounded crown; to 100 ft. high.

BARK: Dark gray often almost black; close and rather finely divided. Less flaky than sugar or black maples.

LEAVES: 4 to 8 in. long; very dark green above, blade usually wider than long.

FLOWERS: When leaves are half grown, showy, yellow, in stalked corymbs, less drooping and larger than the sugar maple.

FRUIT: With wings diverging in a straight line. Mature in fall.

NUMBER: In

USE: Ornamental shade tree.

SPECIMEN:

157b Petioles with watery sap. Leaves usually longer than wide, somewhat wrinkled. Fig.228. SUGAR MAPLE Acer sáccharum Marsh.

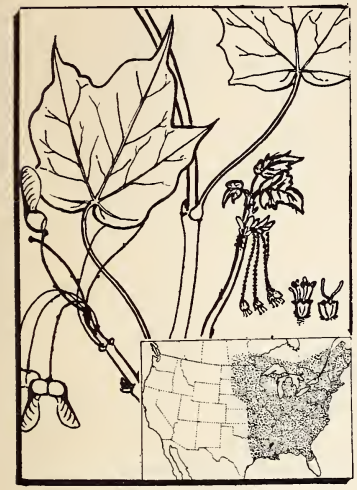


Figure. 228

TREE: Large, handsome, rounded top; 100 to 120 ft. high.

BARK: Light gray-brown, with long deep furrows; scaly.

LEAVES: 5 to 8 in. long. Dark green above, paler beneath. Yellow or sometimes red in autumn.

FLOWERS: Drooping on very slender hairy pedicels; calyx hairy at the apex; petals none; greenish-yellow.

FRUIT: Wings but slightly diverging. Matures in late summer and germinates next spring.

NUMBER: In

USE: Shade, fuel, maple sugar and valuable lumber.

SPECIMEN:

158a Leaves with serrate margins 165

158b Leaves entire 159

159a Pith with cross partitions or large cavities; petioles usually hollow. Fig.229. PAULOWNIA Paulōwnia tomentōsa Steud.

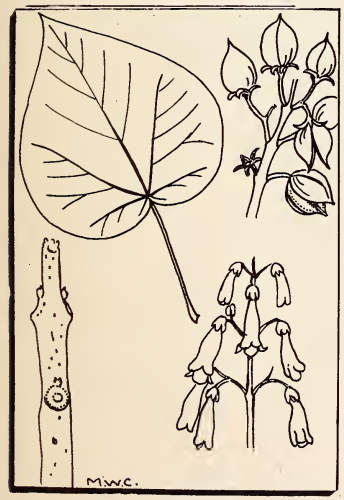


Figure 229

TREE: With short thick trunk and wide rounded top; to 40 ft. high. Native of China and Japan.

BARK: Dark gray, furrowed.

LEAVES: 5 to 15 in. long. Heart-shaped (occasionally 3 lobed) velvet-like.

FLOWERS: Blue or pale violet, 2 in. or more long; in panicles.

FRUIT: In cone-shaped dry capsules 1 to 1½ in. long. Seeds small and numerous.

NUMBER: In

USE: Ornamental.

SPECIMEN:

159b Not as in 159a. 160

160a With large cordate leaves (5 to 12 in. long) usually 3 at a node; long pencil-shaped fruit. Figs.230-231 161

160b Leaves 3 to 4 in. long. 162

161a Flowers many in crowded panicles, lower lobe entire. Fruit pods slender, 1/4 to 1/3 in. thick and rather numerous in panicle. Fig.230. COMMON CATALPA Catălpa bignonoĭdes Walt.

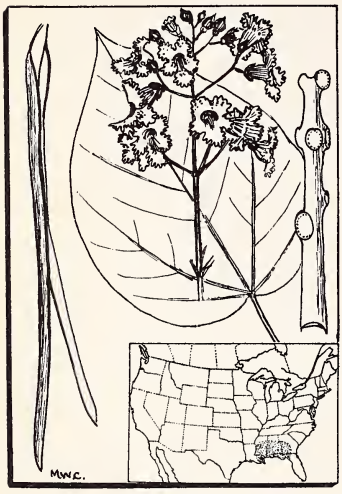


Figure 230

TREE: Wide, rounded top, of few crooked branches; to 60 ft. high.

BARK: Light brown and fairly smooth.

LEAVES: Heart-shaped; 6 to 12 in. long, light green and glabrous above.

FLOWERS: White, spotted with yellow and purple, appearing late in spring; in large panicles long and broad. (Showy.)

FRUIT: Long pods with many winged seeds, hanging on till spring; 10 to 20 in. long. The many pods of smaller diameter distinguishes this tree from the Hardy Catalpa.

NUMBER: In

USE: Shade, wood for fence-posts, rails, etc.

SPECIMEN:

161b Flowers fewer in open panicles, lower lobe notched. Fruit pods 1/2 in. in diameter and few in cluster. Fig.231. HARDY CATALPA Catălpa speciōsa Engl.



Figure 231

TREE: A large, tall tree; to 120 ft. high.

BARK: Thick, light brown, scaly.

LEAVES: Entire, heart-shaped, long-acuminate. 8 to 15 in. long.

FLOWERS: Large, showy, in few flowered panicles; white, sparingly spotted with yellow and purple.

FRUIT: Capsule, 8 to 20 in. long, thick-walled. Seeds 1/3 in. wide with brownish wings terminating in fringe of hairs. The few large capsules distinguish this species from the Common Catalpa which matures many capsules of small diameter.

NUMBER: In

USE: Ornamental. Valuable for fence posts, ties, etc., because of resistance to decay.

SPECIMEN:

162a Leaves pinnately veined to tip; flowers white, fringe-like. Fig.232. FRINGETREE Chionanthus virginica L.



Figure 232

TREE: A shrub or small tree to 30 ft. high.

BARK: Thin with brown and reddish scales.

LEAVES: Dark green above, paler beneath. 4 to 8 in. long.

FLOWERS: White fringe-like, about 1 in. long in drooping panicles 5 to 7 in. long; when leaves are about 1/3 grown.

FRUIT: Fleshy, dark blue with glaucous bloom when ripe in autumn. 1/2 to 3/4 in. long.

NUMBER: In

USE: Ornamental. Bark for medicines.

SPECIMEN:

162b Outer veins of leaf somewhat parallel with the midrib . .163

THE DOGWOODS: Genus CORNUS

163a Leaves opposite. Fig.234 164

163b Leaves alternate, smooth above, fruit blue. Fig.233. BLUE CORNEL Cornus alternifolia L.f.



Figure 233

TREE: With short trunk and flat top to 30 ft. high; often a shrub.

BARK: Thin, smooth, dark reddish-brown.

LEAVES: Rarely opposite. Bright yellow-green above; with white appressed hairs beneath. 3 to 5 in. long.

FLOWERS: In terminal flat topped cymes; cream colored.

FRUIT: On red stems, dark blue when ripe; 1/3 in. in diameter.

NUMBER: In

USE: Wood for turning.

SPECIMEN:

164a Flowers greenish surrounded by 4 large white or pinkish bracts; fruit red. Fig.234.

FLOWERING DOGWOOD Cŏrnus flŏrida L.



Figure 234

TREE: Rounded top; small tree to 40 ft. high.

BARK: Very rough, reddish-brown, divided into short oblong fissures.

LEAVES: Entire, pale underneath, dark green and glabrous, scarlet in autumn, 2 to 5½ in. long.

FLOWERS: 4 large bracts, pinkish-white, very attractive, 1-1/4 to 2½ in. wide, surrounding small greenish-yellow flowers. May, June. Cultivated forms with red bracts.

FRUIT: Ripens in September or October. Scarlet-red, oblong drupe 3/8 in. long with thin, acrid pulp, said to be poisonous.

NUMBER: In

USE: Ornamental. Wood valuable for turning handles, etc.

SPECIMEN:

164b Flowers white; leaves rough above; fruit white. Fig.235.

ROUGHLEAF CORNEL Cŏrnus asperifŏlia Michx.

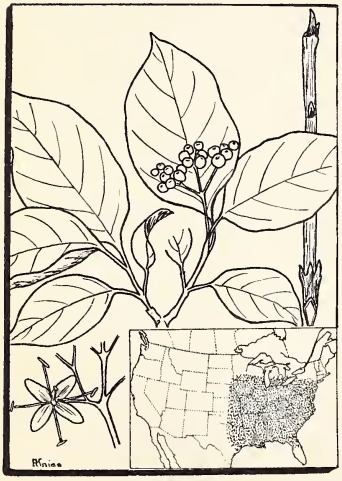


Figure 235

TREE: With narrow open top to 50 ft. high.

BARK: Brown, with narrow ridges and appressed scales.

LEAVES: Dark green and rough above with stiff whitish hairs, pale beneath, 3 to 4 in. long.

FLOWERS: Cream-colored in broad panicles.

FRUIT: White on red stems about 1/4 in. long.

NUMBER: In

USE: Wood used for lathe work.

SPECIMEN:

165a Mature twigs brownish. Winter buds with 2 outer scales 166

165b Mature twigs green. Winter buds with more than 2 outer scales. Flowers purple. Fig.236.

WAHOO Evŏ́nymus atropurpū́reus Jacq.



Figure 236

TREE: Often shrub-like, 6 to 12 ft. high.

BARK: Thin, ashy-gray covered with minute scales. Young twigs green.

LEAVES: 2 to 5 in. long, with stout midrib and primary veins. Pale yellow in autumn.

FLOWERS: Dark, purple; usually in fours; nearly 1/2 in. across. Appear from May to middle of June.

FRUIT: Pods smooth, deeply lobed, salmon-colored. Ripens in October. Seeds 1/4 in. long, scarlet, exposed from fruit.

NUMBER: In

USE: Ornamental. Fruit particularly attractive.

SPECIMEN:

THE BLACKHAWS: Genus VIBŬ́RNUM

166a Petioles with marginal wings. Long pointed winter buds. Fig.237.

NANNYBERRY Vibŭ́rnum lentā́go L.



Figure 237

TREE: Small bushy tree or shrub. Wide rounded top, tough tortuous branches. To 30 ft. high.

BARK: Dark reddish-brown, prominently ridged.

LEAVES: Lustrous dark green, 2-1/4 to 5 in. long.

FLOWERS: Large flat clusters of small white flowers blooming in May or June.

FRUIT: Ripe in September. Blue-black, borne in drooping clusters, stems red. Good to eat. Stone flat, oval.

NUMBER: In

USE: Ornamental.

SPECIMEN:

166b Without margins on petioles. Winter buds short, pointed. 167

167a Petioles and underside of leaves with tangled hairs, reddish-brown. Fig.238.
SOUTHERN BLACKHAW Viburnum rufidulum Raf.

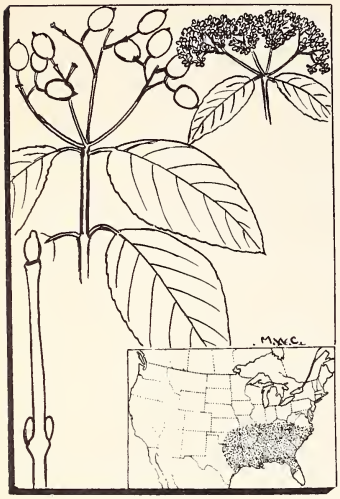


Figure 238

TREE: With irregular open head to 40 ft. high.

BARK: Brown, thin irregularly roughened.

LEAVES: Shining dark green above, lighter and dull beneath, 2½ to 4 in. long.

FLOWERS: About 1/4 in. across, white; in large flattened corymbs.

FRUIT: A flattened drupe 1/2 to 2/3 in long, bright blue with whitish bloom on red stems.

NUMBER: In

USE: Ornamental.

SPECIMEN:

167b Leaves and petioles usually glabrous, winter buds with brown pubescence. Fig.239. BLACKHAW Viburnum prunifolium L.

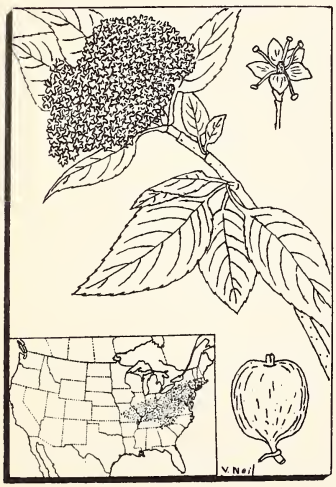


Figure 239

TREE: Bushy tree or shrub; to 30 ft. high.

BARK: Gray, broken by fine ridges.

LEAVES: Shining dark green above, paler beneath. Rather thick, 2 to 3 in. long.

FLOWERS: White, about 1/4 in. across in flat clusters; 2 to 4 in. across.

FRUIT: A flattened drupe on red stems, dark blue with whitish bloom when ripe.

NUMBER: In

USE: Medicine from the bark.

SPECIMEN:

168a Leaves palmately compound. Fig.240 169

168b Leaves trifoliate or pinnately compound. Fig.193 171

THE BUCKEYES: Genus Aĕ́sculus

169a Terminal buds not sticky; most often 5 leaflets 170

169b Terminal buds sticky; flowers white marked with lavender and yellow. Leaflets usually 7 with sharp double curve at tip. Fig.240. HORSE CHESTNUT Aĕ́sculus hippocắstanum L.

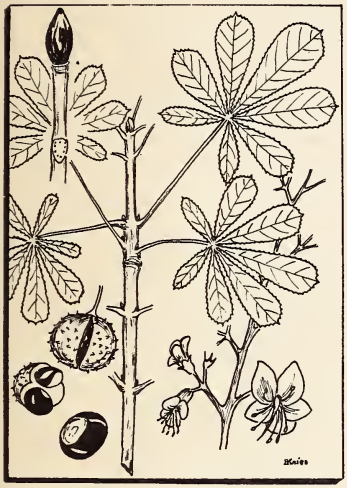


Figure 240

TREE: 75 to 80 ft. high, diameter 2 or 3 ft. pyramidal top, large sticky winter buds. A native of Southern Asia.

BARK: Dark brown, large flakes.

LEAVES: Palmately compound with usually 7 pointed leaflets. 10 to 15 in. long.

FLOWERS: White spotted with yellow and purple in large showy panicles. May or June.

FRUIT: Rounded, 2 to 3 in. in diameter, covered with spines; seed 1 to 1½ in. long, dark mahogany with large hilum.

NUMBER: In

USE: Shade tree. Bark rich in tannin and used in medicine.

SPECIMEN:

170a Flowers red, calyx tubular; fruit without prickles. Fig.241. RED BUCKEYE Aĕ́sculus pắvia L.



Figure 241

TREE: Shrub or tree with open head; to 35 ft. high.

BARK: Smooth, dark gray.

LEAVES: 7 to 13 in. long. Shining dark green, pale yellow, green below.

FLOWERS: Red, in panicles, to 8 in. long.

FRUIT: Spherical smooth, with one or two chestnut brown seeds, their hilum small.

NUMBER:

USE: Ornamental planting.

SPECIMEN:

170b Flowers yellow or red, calyx bell-shaped. Fruit without prickles. Fig.242. YELLOW BUCKEYE Aĕsculus octăndra Marsh.

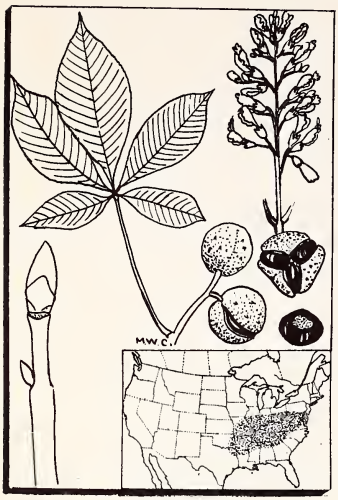


Figure 242

TREE: With well rounded top to 90 ft. high.

BARK: Dark brown, broken into irregular areas.

LEAVES: 8 to 13 in. long; dark yellow-green.

FLOWERS: In panicles 5 to 8 in. long, yellow or occasionally red.

FRUIT: Smooth, usually 2 seeded.

NUMBER: In

USE: Wooden-ware of many kinds, paper pulp, lumber, etc.

SPECIMEN:

170c Flowers yellow, calyx bell-shaped; fruit with prickles. Fig.243. OHIO BUCKEYE Aĕsculus glābra Willd.



Figure 243

TREE: Spreading, rounded top; 70 to 100 ft. high. Trunk up to 6 ft. in diameter. Winter buds dry.

BARK: Fetid, rough; young twigs, smooth gray with prominent orange lenticles.

LEAVES: Palmately compound with usually 5 leaflets. Narrower than in Horse chestnut.

FLOWERS: Pale yellow-green appearing in April and May in panicles 5 to 6 in. long.

FRUIT: On a stout stem, pale brown, 1 to 2 in. long, with thick prickly valves. Seed, bright, shiny, reddish-brown.

NUMBER: In

USE: Artificial limbs, wooden-ware, paper pulp. Leaves, young shoots and seeds poisonous to cattle.

SPECIMEN:

171a Leaflets 3 to 7 with veins extending into the sharp pointed serrations; stipules present. Fig.244.

BOXELDER Ācer negŭndo L.

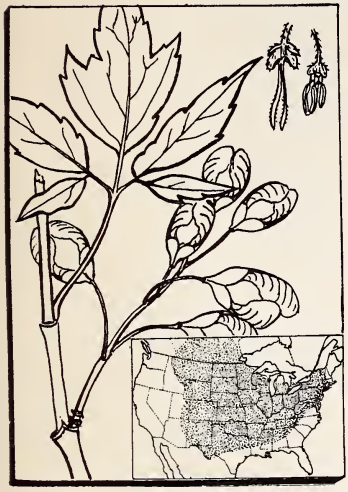


Figure 244

TREE: Rather wide spreading top and short trunk, 2 to 4 ft. in diameter. 50 to 75 ft. in height. (One of the Maples).

BARK: Rough, greenish-gray; young twigs green.

LEAVES: Pinately compound with 3 to 5 leaflets.

FLOWERS: Very small, yellowish-green appearing before leaves. Trees distinctly male and female.

FRUIT: Winged 1 to 2 in. long. Ripens in early summer and hangs on tree for months.

NUMBER: In

USE: Quick growing shade tree. Wood of little value except for fuel.

SPECIMEN:

171b Leaflets entire or with rounded serrations; veins not extending into serrations 172

171c All leaves with 3 leaflets; bark with strong odor; fruit an inflated pod as pictured. Fig.245.

AMERICAN BLADDERNUT Staphylēa trifōlia L.



Figure 245

TREE: Shrub or small tree 8-10 ft. high.

BARK: Smooth, striped.

LEAVES: Trifoliate, 4-6 inches long. Leaflets rather sharp pointed.

FLOWERS: Perfect; bell-shaped in drooping raceme-like clusters. Yellowish-white. May.

FRUIT: Large three celled inflated pods.

NUMBER: In

USE: Ornamental.

SPECIMEN:

THE ASHES: Genus FRĂXINUS

172a Twigs 4 sided; leaflets 7 to 11, green on both sides. Fig.246. BLUE ASH *Fraxinus quadrangulata* Michx.

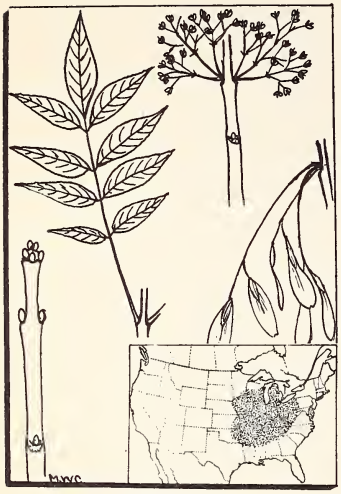


Figure 246

TREE: With slender head; to 100 ft. or more high.

BARK: Light gray furrowed into large plates.

LEAVES: Yellow-green above; paler beneath; glabrous throughout.

FLOWERS: Before the leaves; perfect, very simple; in open panicles.

FRUIT: Winged 1 to 2 in. long.

NUMBER: In

USE: Lumber, implements, dye.

SPECIMEN:

172b Twigs not 4 sided 173

173a Twigs and petioles pubescent or velvety 174

173b Twigs almost if not entirely smooth 175

174a Fruit mostly 2 in. or more long, leaflets pubescent beneath. Fig.247. PUMPKIN ASH *Fraxinus profunda* Bush.

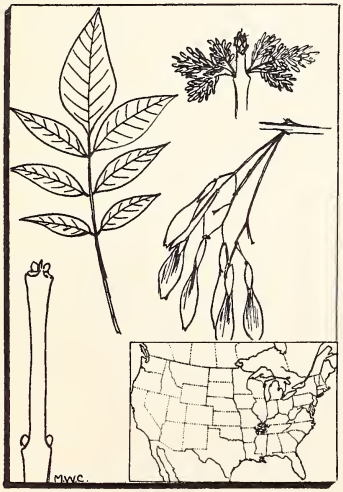


Figure 247

TREE: With narrow open top to 110 ft. high.

BARK: Light gray; rather deeply ridged.

LEAVES: 6 to 15 in. long; dark yellow-green.

FLOWERS: Dioecious, in panicles.

FRUIT: 2 to 3 in. long, winged.

NUMBER: In

USE: Cultivated; flooring and implements.

SPECIMEN:

174b Fruit mostly less than 2 in. long. Fig.248.
RED ASH Fráxinus pennsylvánica Marsh.

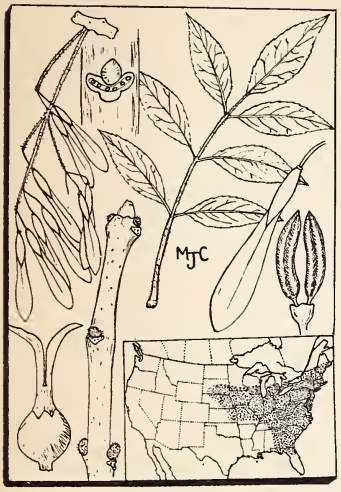


Figure 248

TREE: With irregular top to 60 ft. high.

BARK: Somewhat smooth; brown tinged with red.

LEAVES: Light yellow-green above, pale and pubescent beneath, 8 to 12 in. long.

FLOWERS: Dioecious in panicles.

FRUIT: Winged 1 to 2 in. long.

NUMBER: In

USE: Handles, implements, etc.

SPECIMEN:

175a Fruit flattened, the wing present its full length. Leaflets 7 to 11, sessile. Fig.249.
BLACK ASH Fráxinus nígra Marsh.



Figure 249

TREE: Rounded top, 80 to 90 ft. high.

BARK: Gray, slightly tinged with red. Divided into large irregular plates, separating into thin scales.

LEAVES: Pinnately compound, 12 to 16 in. long. Leaflets 7 to 11, sessile. Dark green above, paler below.

FLOWERS: Inconspicuous, without calyx or corolla. Dioecious.

FRUIT: Winged all around, flattened, faintly-veined body. Ripens in late summer.

NUMBER: In

USE: Furniture, interior finishing, Indian baskets.

SPECIMEN:

175b Base of fruit cylindrical; wing almost wholly terminal. Leaflets pale beneath. Fig.250.

WHITE ASH Frắxinus americā́na L.

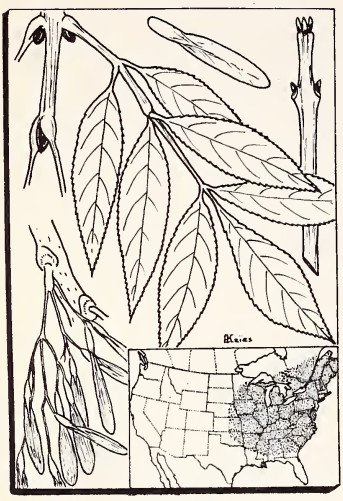


Figure 250

TREE: Sometimes 120 ft. high with tall massive trunk, 5 to 6 ft. in diameter having in forest a narrow crown; in open a round or pyramidal crown.

BARK: Dark brown or grey tinged with red, deeply divided by narrow fissures into broad ridges.

LEAVES: Pinnately compound, 5 to 11 leaflets, dark green above, pale or light green below. Purple and yellow in autumn.

FLOWERS: Dioecious, simple, dark purple in large clusters. April, May.

FRUIT: A winged seed, 1 to 2 in. long.

NUMBER: In

USE: Tool handles, agricultural implements and lumber.

SPECIMEN:

175c Base of fruit cylindrical. Leaflets green and glabrous on both sides. Fig.251.

GREEN ASH Frắxinus pennsylvắnica lanceolā́ta Sarg.

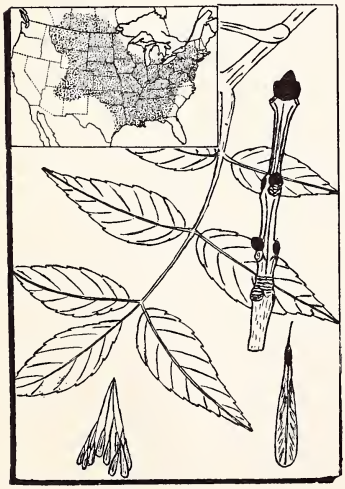


Figure 251

TREE: Large, round-top with slender spreading branches, 60 to 80 ft. high.

BARK: Brown tinged with red, slightly furrowed. Twigs smooth.

LEAVES: 10 to 12 in. long, 7 to 9 leaflets, green on both sides.

FLOWERS: Dioecious, appear late in spring, short slender filaments and linear oblong light green anthers tinged with purple.

FRUIT: With spatulate wing, 1 to 2 in. long.

NUMBER: In

USE: Shade and ornamental especially in West. Wood used same as White Ash though likely inferior to it.

SPECIMEN:

PICTURED KEY FOR IDENTIFYING THE GENERA OF TREES IN WINTER

1a Trees retaining green leaves throughout the winter. 2

1b Leaves falling from the tree during winter, or at least losing their green color. 7

2a Leaves needle-like, awl-like or scale-like; fruit a dry cone or a berry. Fig.252.
THE CONIFERS Turn to page 17*



Figure 252

*Since almost all of our cone bearing trees which are included here have the same characters in winter that they possess at other seasons, the reader is referred to the regular key for further determinations of this group.

2b Leaf blades expanded. (Retained on trees, green throughout the winter). 3

3a Leaves with spine tipped teeth; fruit a red berry. Fig.253. AMERICAN HOLLY Genus Ilex
Turn to Fig.126, Page 67

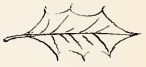


Figure 253

3b Leaves entire (margin not cut in any way) 4

4a Leaves yellow-green, fruit an acorn.
LIVE OAK Genus Quercus Turn to Fig.115, Page 62

4b Not as in 4a. 5

5a Leaves aromatic if broken.
REDBAY Genus Persea Turn to Fig.68, Page 41

5b Leaves not aromatic 6

6a Leaves 4 to 12 in. long.
GREAT-LAUREL Genus Rhododendron Turn to Fig.70, Page 42

6b Leaves 3 to 4 in. long.
MOUNTAIN LAUREL Genus Kalmia Turn to Fig.69, Page 41

7a Twigs with thick dwarf branches (from which leaves grow year after year). Fig.254. 8

7b Twigs without dwarf branches. 9

8a Twigs scaly; fruit a cone, often present. Fig.254a. THE LARCHES Genus Larix
Turn to Figs.18 and 19 Page 18

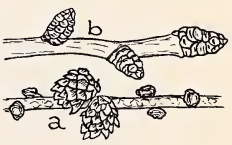


Figure 254

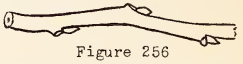
8b Twigs smooth yellowish-gray, no cones. Fig.254b.
THE MAIDENHAIR-TREE Genus Ginkgo Turn to Fig.15, Page 17

9a Leaf scars usually whorled (3 at each node). Long pencil-shaped brown pods usually in evidence.
CATALPA Genus Catalpa Turn to Figs.230 and 231, Page 118

9b Leaf scars opposite (2 at each node). Fig.255. 10


Figure 255

9c Leaf scars alternate (only one at each node). Fig.256. 17


Figure 256

10a Pith large usually with diaphragms (cross partitions); conical, brown fruit about 1½ in. long usually in evidence. Bundle scars in an ellipse.
PRINCESS TREE Genus Paulownia Turn to Fig.229, Page 117

10b Pith solid. Bundle scars not in an elipse or ring. 11

11a Bundle scars 1 or several so closely united as to appear as one. Fig.257a 12

11b Bundle scars more than 1. Fig.257b . . .14

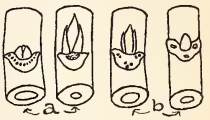


Figure 257

12a Twigs green, usually bearing 4 ridges, making the twig feel square. Pith square or diamond-shaped in cross section. WAHOO Genus Evonymus Turn to Fig.236, Page 121

12b Twigs not green; pith round or nearly so. 13

13a Leaf scars close to the bark; fruit winged; lenticels not large; buds rough or pubescent.
THE ASHES Genus Fraxinus Turn to Page 126

13b Leaf scars on short stalks, concave; lenticels large; fruit a drupe.
FRINGE TREE Genus Chionanthus Turn to Fig.232, Page 119

14a Twigs green, strongly scented; buds with 4 stipular scars. Bladder-like fruit sometimes in evidence.
BLADDERNUT Genus Staphylea Turn to Fig.245, Page 125

14b Without stipular scars. 15

15a At least some of the buds ½ in. or more in length, with numerous scales; leaf scars (a) heart-shaped; fruit scars (b) round or oval, both large. Fig.258.
THE BUCKEYES Genus Aesculus Turn to Page 123

15b None of the buds ½ in in length. 16



Figure 258

16a Terminal buds with one main pair of scales visible, and a small pair at base. Fig.259a.
THE BLACKHAWS Genus Virburnum Turn to Page 121

16b Terminal buds with several pairs of visible scales. Leaf scars v-shaped with 3 to 5 bundle scars. Double winged fruit sometimes in evidence. Fig.259b.
THE MAPLES Genus Acer
Turn to Page 113 and to Fig.244

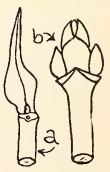
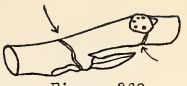


Figure 259

17a Twigs with stipular scars or ridges entirely circling the twig. Fig.260. 18

17b Twigs without complete stipular rings . . 20


Figure 260

18a Leaf scars wholly surrounding the bud, due to leaf base having covered the bud; bark of upper limbs greenish-white, Fruit, hanging brown balls about 1 in. in diameter often on tree through the winter.
SYCAMORE Genus Plătynus Turn to Fig.176, Page 90

18b Leaf scars below the buds; terminal buds large and active .19

19a Buds smooth, pith diaphragmed (Fig.261a); fruit, dry and brownish, as pictured, often retained during the winter. THE TULIPTREE Genus Liriodĕndron
Turn to Fig.62, Page 38

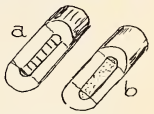


Figure 261

19b Buds usually downy or with whitish bloom; pith solid (Fig. 261b), fruit red. THE MAGNOLIAS Genus Magnŏlia Turn to Page 38

20a Trees with thorns, spines or prickles 21

20b Trees without thorns, spines or prickles. 29

21a Stems thickly covered with prickles.
Leaf scars large, nearly encircling the stem. Fig.262. HERCULES CLUB Genus Arālia
Turn to Fig.198, Page 102


Figure 262

21b With, usually, only a pair of rather heavy prickles near the nodes. Leaf scars broad but not encircling the stem. Buds pubescent. PRICKLEY ASH Genus Xanthŏxylum
Turn to Figs.206 and 207, Page 106

21c Stems without numerous prickles between the nodes 22

22a Young twigs covered with woolly white scales; buds silvery.
RUSSIAN OLIVE Genus Elaeăgnus Turn to Fig.74, Page 43

22b Twigs not as in 22a 23

23a One spine on each side of the leaf scar (modified stipules). Fig.263. 24

23b Thorns not at side of buds; connected with the wood 25


Figure 263

24a Leaf scar on membranes; covering two or more axillary buds. Fig.263.
LOCUST Genus Robĭnia Turn to Figs.202 and 203, Page 104

24b Leaf scar below the bud; buds pubescent.
PRICKLEY ASH Genus Xanthŏxylum
Turn to Figs.206 and 207, Page 106

25a With sturdy thorns on sides of twigs but no terminal thorns. 26

25b Trees with terminal or spur-like branches ending in thorns; with or without thorns on sides of branches. Fig.264 27



Figure 264

26a With one sharp thorn at the side of each axillary bud. Large, orange-like fruit balls often present on tree or ground. Fig.265.
OSAGE-ORANGE Genus Maclūra
Turn to Fig.61, Page 37

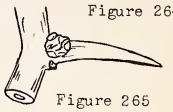


Figure 265

26b Thorns usually branched; above the leaf axils and on the trunk. Fig.266. Fruit a flat bean-like pod.
HONEY LOCUST Genus Gleditsia
Turn to Figs.195 and 196, Page 100



Figure 266

26c Thorns axillary, usually unbranched. Fruit a small pome with bony center. Fig.267.
THE HAWTHORNS Genus Crataegus
Turn to Fig.154, Page 80



Figure 267

27a Terminal bud present. 28

27b Terminal bud falling off, leaving a scar. Twigs glabrous, often with prominently marked lenticels.
PLUMS AND CHERRIES Genus Prūnus Turn to pp.84 and 88

28a Buds conical, pubescent; twigs yellowish-olive, smooth. Trees usually tall with rather slender top.
PEAR Genus Pyrus Turn to Fig.157, Page 82

28b Buds rounded, downy or pubescent; twigs usually pubescent. Trees with rounded top and spreading branches.
THE APPLES Genus Mālus Turn to Figs.158 and 159, Page 82

29a Leaf scars and axillary buds in two distinct rows on the twig (third and fifth directly above the first). Fig.268a 30

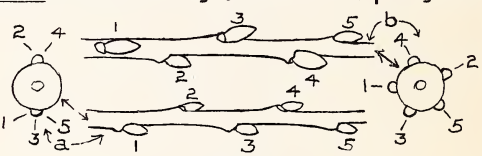


Figure 268

29b Leaf scars in more than two rows on the twig. Fig.268b . .37

30a With 3 bundle scars. Fig.269a. 31

30b Bundle scars scattered; more than 3. Fig.269b. 68



Figure 269

30c With but 1 bundle scar; 2 exterior bud scales; pith often with cavities.
PERSIMMON Genus Diospyros Turn to Fig.77, Page 44

31a Pith with diaphragms, with or without cavities. Fig.261a.
THE HACKBERRIES Genus Celtis
Turn to Figs.178 and 179, Page 92

31b Pith solid. Fig.261b 32

32a Terminal bud without a covering of bud scales, hairy. Twigs zig-zag; lateral buds on short stalks. Fig.270. WITCH HAZEL Genus Hamamēlis
Turn to Fig.82, Page 46


Figure 270

32b Terminal bud covered with scales, slender long pointed; leaf scars narrow.
SERVICEBERRY Genus Amelănchier Turn to Fig.125, Page 67

32c Terminal bud absent, or if present the leaf scar is oval or semi-circular. 33

33a Twigs dark brown, without speckles, leaf scars oblique. Buds not superposed 34

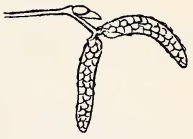
33b Twigs speckled, reddish-brown; buds reddish-violet, often in clusters. Dry, brown bean-like pods, 1½ to 2½ in. long, often on tree during winter.
RED BUD Genus Cĕrcis Turn to Fig.177, Page 91

34a Small tree with unbroken bluish-gray bark; trunk with prominent ridges.
BLUE BEACH Genus Carpĭnus Turn to Fig.91, Page 50

34b Not as in 34a 35

35a No catkins in evidence in winter. Twigs of some species with cork wings. Buds usually rounded.
THE ELMS Genus Ŭlmus Turn to Page 46

35b With young male catkins present in winter. Fig.271 36


Figure 271

36a Bark of tree usually in papery layers; terminal buds present.
THE BIRCHES Genus Bĕtula Turn to Page 51

36b Bark divided into fine scales usually running spirally on trunk and larger branches. No terminal bud.
IRON WOOD Genus Ŏstrya Turn to Fig.92, Page 51

37a With 2 or more buds at each leaf scar placed one above the other (superposed); all but one is often very small. Fig.272a 38

37b Only one bud at each leaf scar or 2 or more placed side by side. Fig.272b 45



Figure 272

38a Pith with cross partitions (diaphragms) separated by open air spaces. Fig.261a. 39

38b Pith with cross partitions but with intervening spaces filled with pith; no stipular scars; bundle scars 3. Fig.261a.
THE GUMS Genus Nyssa Turn to Page 68

38c Pith solid without cross partitions. Fig.261b. 40

39a Twigs slender, pith small, white or greenish; leaf scars a half circle. SILVERBELL Genus Halĕsia Turn to Fig.127, Page 68

39b Twigs stout; pith brown; leaf scars with 3 bundle scars.
THE WALNUTS Genus Jūglans Turn to Page 97

40a Buds scarcely projecting beyond the surface; tip of branch or at least the terminal bud dying. 41

40b Buds standing out prominently, though not necessarily large. 43

41a Buds surrounded by leaf scar. Fig.273. 42



Figure 273

41b Buds not surrounded by leaf scar; pith large, brown. Broad thick bean-like pods often in evidence.
KENTUCKY COFFEETREE Genus Gymnŏ́cladus
Turn to Fig.194, Page 100

42a Twigs often zig-zag; pith small; large bean-like pods often in evidence. HONEY LOCUST Genus Gledítsia
Turn to Figs.195 and 196, Page 100

42b Twigs straight, pith larger, white. Shrub or small tree. Seeds winged. HOP TREE Genus Ptélea Turn to Fig.199, Page 102

43a Buds surrounded by leaf scar, hairy; 5 to 9 bundle scars; small thin bean-like pods often in evidence.
YELLOW-WOOD Genus Cladástris Turn to Fig.201, Page 103

43b Buds not surrounded by leaf scar. 44

44a Pith somewhat star-shaped in cross section, brown or yellowish (Fig.274a); terminal buds large; fruit a nut. THE HICKORIES Genus Cārya
Turn to Page 109



Figure 274

44b Pith round in cross section, Fig.274b. Bundle scars 3. Shrub or small tree. SOAPBERRY Genus Sapíndus
Turn to Fig.208, Page 107

45a Pith triangular in cross section, buds on short stalks (Fig.275); catkins present throughout winter. ALDER Genus Álnus
Turn to Fig.100, Page 54

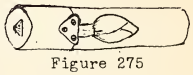


Figure 275

45b Pith not triangular, buds without stalks. 46

46a Buds surrounded by leaf scar; pith large (Fig.276); fruit dry berries in large panicles often retained during winter. THE SUMACS Genus Rhŭs Turn to Page 107



Figure 276

46b Not as in 46a 47

47a Bundle scars more than one. 48

47b Only one bundle scar or so crowded as to seem as only one. Fig.277 66

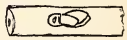


Figure 277

48a Buds enclosed in single sack-like scale (Fig.278a); bundle scars 3; stipular scars present.
THE WILLOWS Genus Sálix Turn to Page 70

48b Outer covering of buds of more than one scale. Fig.278b 49

49a Pith somewhat star-shaped in cross section. Fig.278b 50

49b Pith rounded. Fig.274b 54

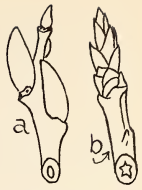


Figure 278

50a Several buds at tip of twigs. Fig.279. Acorns usually in evidence on tree or ground.
THE OAKS Genus Quĕrcus
Turn to Page 55

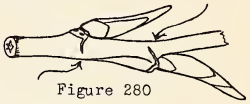

Figure 279

50b Not as in 50a 51

51a Bundle scars 3. Fig.269a 52

51b Bundle scars more than 3, scattered. Fig.269b. 53

52a Stipular scars present (Fig.280); buds often sticky. THE POPLARS Genus Pŏpulus
Turn to Page 76

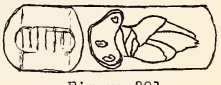

Figure 280

52b Without stipular scars; buds smooth, not sticky; twigs often with cork wings.
SWEET GUM Genus Liquidămbar Turn to Fig.188, Page 97

53a Terminal buds large with 4 or more outer scales; twigs tough, with brown pith. THE HICKORIES Genus Cārya Turn to Page 109

53b Buds small with few outer scales. Prickly burs of fruit usually on tree or ground. THE CHESTNUTS Genus Castānea
Turn to Figs.89 and 90, Page 49

54a Buds on stalks; pith solid but with cross partitions (diaphragms). Fig.281.
THE GUMS Genus Nyssa Turn to Page 68


Figure 281

54b Pith with no cross partitions 55

55a Twigs and coarse pith large, light brown; bark, ill-smelling; leaf scars large; winged seeds often in evidence. Fig.282.
TREE OF HEAVEN Genus Ailănthus
Turn to Fig.197, Page 101


Figure 282

55b Not as above. 56

56a Bark with gummy, aromatic sap. Fruit in large plume-like panicles. SMOKE BUSH Genus Cótinus Turn to Fig.76, Page 44

56b Bark not gummy. 57

57a Twigs without terminal bud. 58

57b Twigs with a terminal bud 60

58a Twigs with stipular scars. Fig.280 59

58b Twigs with but little or no evidence of stipular scars.
THE PLUMS AND CHERRIES Genus Prūnus Turn to Pages 84 and 88

59a Twigs very dark. Fruit a pome.
QUINCE Genus Cydōnia Turn to Fig.78, Page 45

59b Twigs gray. Fruit small berry-like drupe.
BUCKTHORN Genus Rhămnus Turn to Fig.156, Page 81

60a Twigs green or green and red. 61

60b Twigs not as in 60a 62

61a Twigs usually red above and green below, smooth, bark bitter.
PEACH Genus Amygdalus Turn to Fig.160, Page 83

61b Twigs green or greenish-yellow. Fruit, clusters of small berries, often in evidence.
THE DOGWOODS Genus Cōrnus Turn to Page 119

62a Bundle scars 3. Fig.269a 63

62b Bundle scars 5 or more in broad v-shaped leaf scars. Fruit small, red or orange pomes in clusters, sometimes in evidence.
MOUNTAIN ASH Genus Sŏrbus Turn to Figs.204 and 205, Page 105

63a Buds bluntly rounded. Twigs often zig-zag. Fruit a small pome with bony center. Fig.267.
THE HAWTHORNS Genus Crātaegus Turn to Fig.154, Page 80

63b Buds pointed; twigs sometimes with thorn-like stunted branches. 64

64a Buds glabrous or but slightly pubescent. Lenticels often prominent; fruit with single seed.
THE PLUMS AND CHERRIES Genus Prūnus Turn to Pages 84 and 88

64b Not as in 64a 65

65a Twigs glabrous, usually yellowish-olive. Trees usually with slender top. PEAR Genus Pȳrus Turn to Fig.157, Page 82

65b Twigs usually pubescent, if smooth then colored reddish-brown. Trees usually with rounded spreading top.
THE APPLES Genus Mālus Turn to Figs.158 and 159, Page 82

66a Twigs without terminal bud. 67

66b Twigs with terminal bud; twigs green, very spicy.
SASSAFRAS Genus Sassafras Turn to Fig.75, Page 43

67a Twigs glabrous, shining; bark sour. Fruit capsules in panicles persisting throughout the winter.
SOURWOOD Genus Oxydĕndrum Turn to Fig.155, Page 81

67b Twigs pubescent, dull, often zig-zag. Fruit fleshy with flattened seeds.
PERSIMMON Genus Diospȳros Turn to Fig.77, Page 44

68a Pith with cross partitions, solid (Fig.283); bark with ill-smelling odor; bundle scars 5 to 7. Shrub or small tree. PAPAW Genus Asímina Turn to Fig.72, Page 42



Figure 283

68b Pith solid; without cross partitions. 69

69a Buds 3/4 in. or longer, spike-like, with many dry scales. BEECH Genus Fágus Turn to Fig.88, Page 49

69b Buds not as in 69a. 70

70a Pith star-shaped in cross section. Fig.284. Spiny fruit burs often in evidence.
THE CHESTNUTS Genus Castánea
Turn to Figs.89 and 90, Page 49



Figure 284

70b Pith rounded in cross section 71

71a Outer bud scales 1 to 3 72

71b Outer bud scales more than 3; twigs brownish-yellow; sap somewhat milky. THE MULBERRIES Genus Mórus
Turn to Page 93

72a Buds usually fleshy and often bright red; sap watery; fruit, as pictured, often in evidence.
THE BASSWOODS Genus Tília Turn to Page 94

72b Buds conical with outer scales striated, not red; sap milky.
PAPER MULBERRY Genus Broussonétia Turn to Fig.180, Page 93



A LIST OF THE TREES IN THEIR LOGICAL ORDER BY FAMILIES



systematic list of any group of living things is convenient for checking and for other phases of their study. Taxonomists do not always agree on the exact sequence of families and species. In making this list it has been attempted to follow the arrangements in the most general use. The numbers assigned to families, genera and species may be combined to make an index number for each species which should prove useful in arranging records and herbarium specimens in a logical order. Thus the index number for the Red Spruce would be 2-3-2, the Sugar Maple, 20-1-4, and the Wild Black Cherry 13-7-1.

GYMNOSPERMS

1. GINKGOÁCEAE Ginkgo Family

1. Genus Ginkgo

1. Maidenhair-tree. Ginkgo biloba L. Fig.15

2. PINÁCEAE Pine Family

1. Genus Pinus The Pines

1. Northern White Pine. . . . Pinus strobus L. Fig.39
2. Limber Pine. Pinus flexilis James Fig.40
3. Loblolly Pine. Pinus taeda L. Fig.44
4. Pitch Pine Pinus rigida Mill. Fig.45
5. Mountain Pine. Pinus pungens Lamb. Fig.52
6. Scrub Pine Pinus virginiana Mill. Fig.49
7. Jack Pine. Pinus banksiana Lamb. Fig.47
8. Shortleaf Pine Pinus echinata Mill. Fig.53
9. Scotch Pine. Pinus silvestris L. Fig.48
10. Slash Pine Pinus caribaea Morel. Fig.43
11. Red Pine Pinus resinosa Ait. Fig.46
12. Longleaf Pine. Pinus australis Michx. Fig.42
13. Austrian Pine. Pinus laricio austriaca Endl. Fig.51
14. Ponderosa Pine Pinus ponderosa Laws. Fig.41

2. Genus Larix The Larches

1. Tamarack Larix laricina Koch Fig.18
2. European Larch Larix decidua Mill. Fig.19

3. Genus Picea The Spruces

1. White Spruce Picea canadensis B.S.P. Fig.36
2. Red Spruce Picea rubra Link. Fig.35
3. Black Spruce Picea mariana B.S.P. Fig.34
4. Norway Spruce. Picea abies Karst. Fig.37
5. Colorado Blue Spruce . . . Picea pungens Englm. Fig.38

4. Genus Abies The Firs

1. Balsam Fir Abies balsamea Mill. Fig.31
2. White Fir. Abies concolor L.& G. Fig.29
3. Fraser Fir Abies fraseri Poir. Fig.30

5. Genus Pseudotsuga

1. Douglas Fir. Pseudotsuga taxifolia Britt. Fig.28

6. Genus Tsuga The Hemlocks

1. Eastern Hemlock. Tsuga canadensis Carr. Fig.32
2. Carolina Hemlock Tsuga caroliniana Englm. Fig.33

7. Genus Taxodium

1. Southern Cypress Taxodium distichum Rich. Fig.20

8. Genus Chamaecyparis

1. Southern White Cedar . . Chamaecyparis thyoides B.S.P. Fig.23

9. Genus Thuja The Arborvitaes

1. American Arborvitae. . . Thuja occidentalis L. Fig.22
2. Chinese Arborvitae . . . Thuja orientalis L.

10. Genus Libocedrus

1. Incense Cedar. Libocedrus decurrens Torr. Fig.21

11. Genus Juniperus The Cedars

1. Common Juniper Juniperus communis L. Fig.24
2. Eastern Red Cedar. . . . Juniperus virginiana L. Fig.25

ANGIOSPERMS

3. SALICACEAE Willow Family

1. Genus Salix The Willows

1. Black Willow Salix nigra Marsh. Fig.142
2. Ward's Willow. Salix longipes Shut. Fig.143
3. Peachleaf Willow Salix amygdaloides Anders. Fig.141
4. Goat Willow. Salix caprea L. Fig.137
5. Shining Willow Salix lucida Muhl. Fig.139
6. Crack Willow Salix fragilis L. Fig.140
7. European White Willow. . Salix alba L.
8. Yellow Willow. Salix vitellina L. Fig.134
9. Weeping Willow Salix babylonica L. Fig.132
10. Sandbar Willow Salix interior Rowl. Fig.133
11. Pussy Willow Salix discolor Muhl. Fig.138
12. Bebb Willow. Salix bebbiana Sarg. Fig.135
13. Basket Willow. Salix purpurea L. Fig.136

2. Genus Populus The Poplars

1. White Poplar Populus alba L. Fig.152
2. Quaking Aspen. Populus tremuloides Michx. Fig.148
3. Largetooth Aspen Populus grandidentata Michx. Fig.146
4. Downy Poplar Populus heterophylla L. Fig.153
5. Balsam Poplar. Populus balsamifera L. Fig.149
6. Eastern Cottonwood . . . Populus deltoides Marsh. Fig.150
7. Lombardy Poplar. Populus italica Moench. Fig.147
8. Carolina Poplar. Populus canadensis Moench. Fig.151

4. JUGLANDACEAE Walnut Family

1. Genus Juglans The Walnuts

1. Butternut. Juglans cinerea L. Fig.192
2. Black Walnut Juglans nigra L. Fig.191
3. Japan Walnut Juglans sieboldiana Maxim. Fig.190
4. English Walnut Juglans regia L. Fig.189

2. Genus Carya The Hickories

1. Pecan. Carya pecan E. & G. Fig.214
2. Shagbark Hickory Carya ovata Koch Fig.217
3. Big Shellbark Hickory. . Carya laciniosa Loud. Fig.216
4. Mockernut Hickory. . . . Carya alba Koch Fig.215
5. Small Pignut Carya ovalis Sarg. Fig.219
6. Water Hickory. Carya aquatica Nutt. Fig.212
7. Pignut Hickory Carya glabra Sweet. Fig.218
8. Bitternut Hickory. . . . Carya cordiformis Koch Fig.213

5. BETULÁCEAE Birch Family

1. Genus Ostrya

1. Iron Wood. Ostrya virginiana Koch Fig.92

2. Genus Carpinus

1. Blue Beech Carpinus caroliniana Walt. Fig.91

3. Genus Betula The Birches

1. Sweet Birch. Betula lenta L. Fig.93
2. Yellow Birch Betula lutea Michx.f. Fig.94
3. River Birch. Betula nigra L. Fig.95
4. Gray Birch Betula populifolia Marsh. Fig.96
5. European White Birch . . Betula alba L. Fig.97
6. Paper Birch. Betula papyrifera Marsh. Fig.98

4. Genus Alnus

1. Black Alder. Alnus glutinosa Gaertn. Fig.100

6. FAGÁCEAE Beech Family

1. Genus Fagus

1. Beech. Fagus grandifolia Ehrh. Fig.88

2. Genus Castanea The Chestnuts

1. American Chestnut. . . . Castanea dentata Borkh. Fig.89
2. Chinquapin Castanea pumila Mill. Fig.90

3. Genus Quercus The Oaks

1. White Oak. Quercus alba L. Fig.120
2. Post Oak Quercus stellata Wang. Fig.121
3. Overcup Oak. Quercus lyrata Walt. Fig.122
4. Burr Oak Quercus macrocarpa Michx. Fig.123
5. Swamp White Oak. Quercus bicolor Willd. Fig.116
6. English Oak. Quercus robur L.
7. Swamp Chestnut Oak . . . Quercus prinus L. Fig.118
8. Chinquapin Oak Quercus muhlenbergii Engelm. Fig.117
9. Chestnut Oak Quercus montana Willd. Fig.119
10. Live Oak Quercus virginiana Mill. Fig.115
11. Northern Red Oak Quercus borealis Michx.f. Fig.109
12. Pin Oak. Quercus palustris Muench. Fig.114
13. Scarlet Oak. Quercus coccinea Muench. Fig.111
14. Shumard Red Oak. Quercus shumardii Buckley Fig.112
15. Jack Oak Quercus ellipsoidalis Hill. Fig.113
16. Black Oak. Quercus velutina Lam. Fig.110
17. Southern Red Oak Quercus rubra L. Fig.107
18. Bear Oak Quercus ilicifolia Wang. Fig.108
19. Water Oak. Quercus nigra L. Fig.106
20. Blackjack Oak. Quercus marilandica Muench. Fig.105
21. Shingle Oak. Quercus imbricaria Michx. Fig.102
22. Laurel Oak Quercus laurifolia Michx. Fig.104
23. Willow Oak Quercus phellos L. Fig.103

7. URTICACEAE Nettle Family

1. Genus Ulmus

1. Slippery Elm Ulmus fulva Michx. Fig.83
2. American Elm Ulmus americana L. Fig.86
3. Rock Elm Ulmus racemosa Thomas Fig.85
4. Winged Elm Ulmus alata Michx. Fig.84
5. Scotch Elm Ulmus glabra Juds.
6. Chinese Elm. Ulmus pumila L. Fig.87

2. Genus Celtis The Hackberries

1. Hackberry. Celtis occidentalis L. Fig.179
2. Southern Hackberry . . . Celtis mississippiensis Bosc. Fig.178

3. Genus Maclura

1. Osage-orange Maclura pomifera Sch. Fig.61

4. Genus Broussonetia

1. Paper Mulberry Broussonetia papyrifera Vent. Fig.180

5. Genus Morus

1. Red Mulberry Morus rubra L. Fig.181
2. White Mulberry Morus alba L. Fig.182
3. Black Mulberry Morus nigra L.

8. MAGNOLIÁCEAE Magnolia Family

1. Genus Magnolia The Magnolias

1. Sweetbay Magnolia virginiana L. Fig.67
2. Cucumber Tree. Magnolia acuminata L. Fig.64
3. Bigleaf Magnolia Magnolia macrophylla Michx. Fig.65
4. Umbrella Magnolia. . . . Magnolia tripetala L. Fig.66
5. Ear-leaved Umbrella Tree Magnolia fraseri Walt. Fig.63

2. Genus Liriodendron

1. Tuliptree. Liriodendron tulipifera L. Fig.62

9. ANONÁCEAE Custard Apple Family

1. Genus Asimina

1. Common Papaw Asimina triloba Dunal. Fig.72

10. LAURÁCEAE Laurel Family

1. Genus Persea

1. Redbay Persea barbonia Spreng. Fig.68

2. Genus Sassafras

1. Sassafras. Sassafras albidum Nees. Fig.75

11. HAMAMELIDÁCEAE Witchhazel Family

1. Genus Hamamelis

1. Witchhazel Hamamelis virginiana L. Fig.82

2. Genus Liquidambar

1. Sweetgum Liquidambar styraciflua L. Fig.188

12. PLATANÁCEAE Plane Tree Family

1. Genus Platanus The Sycamores

1. Sycamore Platanus occidentalis L. Fig.176
2. London Plane Platanus acerifolia Willd. Fig.176

13. ROSÁCEAE Rose Family

1. Genus Pyrus

1. Pear Pyrus communis L. Fig.157

2. Genus Cydonia

1. Quince Cydonia oblonga Mill. Fig.78

3. Genus Malus The Apples

1. Siberian Crab. Malus baccata L.
2. American Crab Apple. . . Malus coronaria Mill.
3. Prairie Crab Apple . . . Malus ioensis Britt. Fig.159
4. Apple. Malus malus Britt. Fig.158

4. Genus Sorbus The Mountain Ashes

1. American Mountain Ash. . Sorbus americana Marsh Fig.204
2. European Mountain Ash. . Sorbus aucuparia L. Fig.205

5. Genus Amelanchier

1. Serviceberry Amelanchier canadensis Medic. Fig.125

6. Genus Crataegus

1. Hawthorns. Crataegus sp. Fig.154

7. Genus Prunus The Cherries and Plums

1. Wild Black Cherry. . . . Prunus serotina Ehrh. Fig.167
2. Choke Cherry Prunus virginiana L. Fig.168
3. Pin Cherry Prunus pennsylvanica L.f. Fig.164
4. Chickasaw Plum Prunus angustifolia Marsh. Fig.175
5. Mahaleb Cherry Prunus mahaleb L. Fig.163
6. Sweet Cherry Prunus avium L. Fig.166
7. Sour Cherry. Prunus cerasus L. Fig.165
8. Canada Plum. Prunus nigra Ait. Fig.173
9. Wild Goose Plum. Prunus hortulana Bailey Fig.171
10. Wild Plum. Prunus americana Marsh. Fig.172
11. European Plum. Prunus domestica L. Fig.174
12. Apricot. Prunus armeniaca L. Fig.169

8. Genus Amygdalus

1. Peach. Amygdalus persica L. Fig.160

14. LEGUMINOSAE Pea Family

1. Genus Gymnocladus

1. Kentucky Coffeetree. . . Gymnocladus dioica Koch. Fig.194

2. Genus Gleditsia The Honey Locusts

1. Honey Locust Gleditsia triacanthos L. Fig.195
2. Water Locust Gleditsia aquatica Marsh. Fig.196

3. Genus Cercis

1. Red Bud. Cercis canadensis L. Fig.177

4. Genus Cladrastis

1. Yellow-wood. Cladrastis lutea Koch. Fig.201

5. Genus Robinia The Locusts

1. Black Locust Robinia pseudoacacia L. Fig.202
2. Clammy Locust. Robinia viscosa Vent. Fig.203

15. RUTACEAE Rue Family

1. Genus Xanthoxylum The Prickley Ashes

1. Northern Prickley Ash. . Xanthoxylum americanum Mill. Fig.206
2. Southern Prickley Ash. . Xanthoxylum clava-herculis L. Fig.207

2. Genus Ptelea

1. Hop Tree Ptelea trifoliata L. Fig.199

16. SIMARUBĀCEAE Quassia Family

1. Genus Ailanthus

1. Tree of Heaven Ailanthus altissima Swingle. Fig.197

17. ANACARDIĀCEAE Cashew Family

1. Genus Cotinus

1. Smoke-tree Cotinus americanus Nutt. Fig.76

2. Genus Rhus The Sumacs

1. Staghorn Sumac Rhus typhina Tor. Fig.210
2. Poison Sumac Rhus vernix L. Fig.209
3. Dwarf Sumac. Rhus copallina L. Fig.211

18. AQUIFOLIĀCEAE Holly Family

1. Genus Ilex

1. American Holly Ilex opaca Ait. Fig.126

19. CELASTRĀCEAE Stafftree Family

1. Genus Evonymus

1. Wahoo. Evonymus atropurpureus Jacq. Fig.236

2. Genus Staphylea

1. American Bladdernut. . . Staphylea trifolia L. Fig.245

20. ACERĀCEAE Maple Family

1. Genus Acer The Maples

1. Striped Maple. Acer pennsylvanicum L. Fig.221
2. Sycamore Maple Acer pseudo-platinus L. Fig.225
3. Mountain Maple Acer spicatum Lam. Fig.224
4. Sugar Maple. Acer saccharum Marsh. Fig.228
5. Silver Maple Acer saccharinum L. Fig.223
6. Red Maple. Acer rubrum L. Fig.222
7. Box Elder. Acer negundo L. Fig.244
8. Black Maple. Acer nigrum Michx.f. Fig.226
9. Norway Maple Acer platanoides L. Fig.227

21. SAPINDĀCEAE Soapberry Family

1. Genus Sapindus

1. Western Soapberry. . . . Sapindus drummondii Hand. Fig.208

2. Genus Aesculus The Buckeyes

1. Horse Chestnut Aesculus hippocastanum L. Fig.240
2. Ohio Buckeye Aesculus glabra Willd. Fig.243
3. Yellow Buckeye Aesculus octandra Marsh. Fig.242
4. Red Buckeye. Aesculus pavia L. Fig.241

22. RHAMNĀCEAE Buckthorn Family

1. Genus Rhamnus

1. Yellow Buckthorn Rhamnus caroliniana Walt. Fig.156
2. European Buckthorn . . . Rhamnus cathartica L.

23. TILIĀCEAE Linden Family

1. Genus Tilia

1. Basswood Tilia glabra Vent. Fig.184
2. White Basswood Tilia heterophylla Vent. Fig.187
3. Downy Basswood Tilia neglecta Spach. Fig.186
4. Small-leaf Linden. . . . Tilia cordata Mill. Fig.185

24. ELAEAGNĀCEAE Oleaster Family

1. Genus Elaeagnus

1. Russian Olive. Elaeagnus angustifolia L. Fig.74

25. ARALIĀCEAE Ginseng Family

1. Genus Aralia

1. Hercules-club. Aralia spinosa L. Fig.198

26. CORNĀCEAE Dogwood Family

1. Genus Cornus The Dogwoods

1. Flowering Dogwood. . . . Cornus florida L. Fig.234
2. Blue Cornel. Cornus alternifolia L. f. Fig.233
3. Roughleaf Cornel Cornus asperifolia Michx. Fig.235

2. Genus Nyssa

1. Black Gum. Nyssa sylvatica Marsh. Fig.131
2. Tupelo Gum Nyssa aquatica Marsh. Fig.129
3. Swamp Black Gum. Nyssa biflora Walt. Fig.130

27. ERICĀCEAE Heath Family

1. Genus Rhododendron

1. Great Laurel Rhododendron maximum L. Fig.70

2. Genus Kalmia

1. Mountain Laurel. Kalmia latifolia L. Fig.69

3. Genus Oxydendrum

1. Sourwood Oxydendrum arboreum D.C. Fig.155

28. SAPOTĀCEAE Sapodilla Family

1. Genus Bumelia

1. Woolly Buckthorn Bumelia lanuginosa Pers. Fig.60

29. EBENACEAE Ebony Family

1. Genus Diospyros

1. Persimmon. Diospyros virginiana L. Fig.77

30. STYRACACEAE Storax Family

1. Genus Halesia

1. Silverbell Halesia carolina L. Fig.127

31. OLEACEAE Olive Family

1. Genus Fraxinus

1. Pumpkin Ash. Fraxinus profunda Bush. Fig.247
2. White Ash. Fraxinus americana L. Fig.250
3. Red Ash. Fraxinus pennsylvanica Marsh. Fig.248
4. Green Ash. Fraxinus pennsylvanica lanceolate Sarg. Fig.251
5. Black Ash. Fraxinus nigra Marsh. Fig.249
6. Blue Ash Fraxinus quadrangulata Michx. Fig.246

2. Genus Chionanthus

1. Fringetree Chionanthus virginica L. Fig.232

32. BIGNONIACEAE Bignonia Family

1. Genus Catalpa

1. Hardy Catalpa. Catalpa speciosa Englm. Fig.231
2. Common Catalpa Catalpa bignonioides Walt. Fig.230

2. Genus Paulownia

1. Paulownia. Paulownia tomentosa Steud. Fig.229

33. CAPRIFOLIACEAE Honeysuckle Family

1. Genus Viburnum The Haws

1. Nannyberry Viburnum lentago L. Fig.237
2. Blackhaw Viburnum prunifolium Neil. Fig.239
3. Southern Blackhaw. . . . Viburnum rufidulum Raf. Fig.238



INDEX AND ILLUSTRATED GLOSSARY

It will be noted that the uncapitalized items represent the species names of the trees described in this book.

A

Abies 22
abies 27
Acer 113,125
acerifolia 90
Acuminate: leaf blade with very sharp point or base p.10: fig.285a
Acute: leaf blade with fairly sharp point or base p.10: fig.285b



Figure 285

Aesculus 123
Ailanthus 101
alata 47
alba 53,64,71,79,94,110
albidum 43
Alder 54
Alnus 54
alternifolia 119
Amelanchier 67
Ament: a tassel-like group of flowers p.11: fig.286


Figure 286

americana 48,88,105,128
American Elm 48
American Mountain-ash 105
americanum 106
americanus 44
amygdaloides 74
Amygdalus 83
angustifolia 43,90
Apple 82
Apricot 87
aquatica 68,101,109
Aralia 102
Arboretum 13
arboreum 81
Arborvitae 20
Aristate: with a bristle at tip of leaf p.10: fig.287


Figure 287

armeniaca 87
Aromatic: with spicy fragrance
Ashes 125
Asimina 42
asperifolia 120
atropurpureus 121
aucuparia 105
australis 29
austriaca 34
Austrian Pine 34
Author 11
Authority 11
avium 86
Axil: the point on a stem immediately above the base of a leaf fig.288

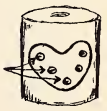

Figure 288

B

babylonica 70
balsamea 24
Balsam Fir 24
balsamifera 78
Balsam Poplar 78
banksiana 32
Basket Willow 72
Basswood 95
Bear Oak 58
bebbiana 71
Bebb Willow 71
Beech 49
Betula 51
bicolor 62
biflora 69
bignonoides 118
Big Shellbark Hickory 111
Bigtree 8
biloba 17
Birches 51
Bisexual: both sexes represented in the same tree 10
Bitternut Hickory 109
Black Alder 54
Black Ash 127
Black Gum 69
Blackhaw 122
Blackhaws 121
Blackjack Oak 57
Black Locust 104
Black Maple 116
Black Mulberry 94
Black Oak 59
Black Spruce 25
Black Walnut 99
Black Willow 75
Bloom: a white powdery covering on fruit or leaves
Blue Ash 126
Blue Beech 50
Blue Cornell 119
borbonia 41
borealis 59
Boxelder 125
Bract: leaf-like part at base of flower or other plant part fig.289


Figure 289

Broadleafs 36
Broussonetia 93
Buckeyes 123
Buckthorn 81
Budding 6,14
Bumelia 37
Bundle scar: ends of vascular bundles showing in leaf scars fig.290


Figure 290

Burr Oak 66
Butternut 99
Buttress: a brace-like ridge at base of tree trunk 19

C

Calyx 10
Cambium 8
Canada Plum 89
canadensis 24,26,67,79,91

Canoe Birch 54
Capsule: a dry fruit of two or more carpels fig.291



Figure 291

caprea 72
caribaea 30
carolina 68
Carolina Poplar 79
caroliniana 25,50,81
Carpel: one section (a) of a compound pistil (b) fig.292

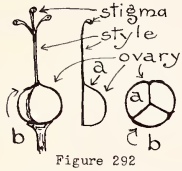


Figure 292

Carpellate: having carpels (pistil); a female flower
Carpinus 50
Carya 108
Castanea 49
Catalpa 118
cathartica 81
Catkin: a tassel-like inflorescence; an ament 11
Cedar 19,21
Celtis 92
Census 12
cerasus 85
Cercis 91
Cherries 84
Chestnut 49
Chestnut Oak 64
Chickasaw Plum 90
Chinese Elm 48
Chinquapin 50
Chinquapin Oak 62
Chionanthus 119
Choke Cherry 87
cinerea 99
Cladrastis 103
Clammy Locust 104
clava-hercules 106
coccinea 60
Coffeetree 100
Colorado Blue Spruce 27
Common Catalpa 118
Common name 11
communis 21,82
Compound: Leaves made up of several leaflets fig.293



Figure 293

concolor 23
Conical: shaped somewhat like a cone
Conifers 17
copallina 108
cordata 95
Cordate: heart-shaped p.10: fig.294



Figure 294

cordiformis 109
Cork 7
Cornus 119
Corolla: all of the petals of a flower taken together 10
Corymb: a flat topped inflorescence in which the lower flowers bloom first p.11: fig.295

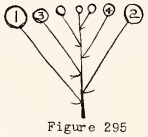


Figure 295

Cotinus 44
Cottonwood 78
Crack Willow 74
Crataegus 80
Crenate: with rounded teeth p.10: fig.296



Figure 296

Cuttings 6
Cydonia 45
Cylindrical: shaped somewhat like a cylinder
Cyme: a flat topped inflorescence in which the middle flower blooms first p.11: fig.297

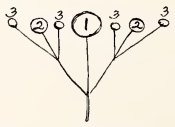


Figure 297

Cypress 19

D

decidua 18
Deciduous: falling at end of growing period
decurrens 19
Deliquescent 9
deltoides 78
dentata 49
Dentate: with teeth p.10: fig.298



Figure 298

Diaphragm: cross partition in pith
Dicotyledons: plants with two seed leaves; usually with net veined leaves and flowering parts in 4's or 5's 36
Dioecious: distinctly male or female 10
dioica 100
Diospyros 44
discolor 73
distichum 19
Dogwoods 119
domestica 89
Doubly serrate: with small serrations on the larger saw-like teeth p.10: fig.299



Figure 299

Douglas Fir 22
Downy Basswood 96
Downy Poplar 80
drummondii 107
Drupe: fleshy fruit with single seed as plum or cherry
Dwarf branches: slow growing branches that bear leaves year after year. See figs.15 and 19
Dwarf Sumac 108

E

Ear-leaved Umbrella Tree 38
echinata 35
Elaeagnus 43
ellipsoidalis 61
Elms 46
Emarginate: Leaf notched at the tip p.10: fig.300



Figure 300

English Oak 64
English Walnut 98

Entire: leaves or other parts that are neither cut or lobed p.10: fig.301



Figure 301

European Buckthorn 81
European Mountain-ash 105
European Plum 89
European White Birch 53
Evonymus 121
Excurrent 9

F

Fagus 49
Fasicle: a cluster
Fir 22
Firs 22
Fissures: cracks in bark, etc.
Flat Peach 83
flexilis 28
florida 120
Flowering Dogwood 120
Flowers: for parts of flowers see pp.7,10
fragilis 74
Fraser Fir 23
fraseri 23,38
Fraxinus 125
Fringetree 119
Fruit: the seed bearing part of a plant 7,10
Fruit Scars: mark on a stem where fruit was attached, see fig.258
fulva 46

G

Galls: abnormal growths caused by insects 12,14
Germinate: starting to grow
Ghost leaf 15
Ginkgo 17
glabra 95,112,124
Glabrous: without hairs
Gland: a secreting cell
glandulosa 101
Glaucous: covered with a fine white or bluish powder
Gledtisia 100
Globose: shaped like a ball
glutinosa 54
Goat Willow 72
Grafting 6,14
grandidentata 76
grandifolia 49
Gray Birch 53
Great Laurel 42
Green Ash 128
Gums 68
Gymnocladus 100
Gymnosperms 17

H

Hackberry 92
Hardy Catalpa 118
Halesia 68
Hamamelis 46
Hastate: a type of leaf 10
Hawthorns 80
Head: an inflorescence in which sessile flowers seem to arise from a common center p.11: fig.302



Figure 302

Heartwood 8
Hemlock 24
Herbs: plants with little or no woody tissue 5
Hercules-club 102
heterophylla 80,96
Hickories 108
Hilum: scar on a seed where it was attached to its stem fig.303



Figure 303

hippocastanum 123
Holly 67
Honey Locust 100
Hoptree 102
Horse Chestnut 123
hortulana 88
Husk: outer covering of nut or fruit
Hybrid: a cross between two species

I

Ilex 67
ilicifolia 58
imbricaria 55
Inflorescence: arrangement of flowers, see fig.10
Insects 12
interior 70
Internode 9
iowensis 83
Ironwood 51
italica 77

J

Jack Oak 61
Jack Pine 32
Japanese Walnut 98
Juglans 98
Juniper 21
Juniperus 21

K

Kalmia 41
Kentucky Coffeetree 100
Kernel: interior part of nut or seed
Knees: root structures rising out of water; for respiration 19

L

laciniosa 111
lanceolata 128
Lanceolate: lance shaped fig.304



Figure 304

lanuginosa 37
Larch 18
Largetooth Aspen 76
laricina 18
laricio 34
Larix 18
Lateral: along the side
latifolia 41
Laurel Oak 56
laurifolia 56
Leaflets: expanded parts of a compound leaf fig.305



Figure 305

Leaf scar: mark on stem where leaf was attached fig.306

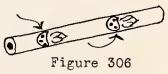


Figure 306

Leaf Shapes: see fig.8, page 10
lenta 51
lentago 121
Lenticle: opening in bark for respiration; often quite prominent
Libocedrus 19
Lignin 5

Limber Pine 28
Linear: long and narrow with sides nearly parallel fig.307

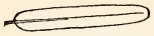


Figure 307

Liquidambar 97
Liriodendron 38
Live Oak 62
Loblolly Pine 30
Lombardy Poplar 77
London Plane 90
longipes 75
Longleaf Pine 29
lucida 73
Lustrous: shining
lutea 52,103
lyrata 65

M

Maclura 37
macrocarpa 66
Magnolias 38
mahaleb 84
Mahaleb Cherry 84
Maidenhair-tree 17
Malus 82
malus 82
Maples 113
mariana 25
marilandica 57
maxima 42
mississippiensis 92
Mockernut Hickory 110
Monoecious: bearing both male and female parts in the same tree 10
montana 64
Morus 93
Mountain Laurel 41
Mountain Maple 115
Mountain Pine 34
Mucronate: with an abruptly short sharp tip p.10: fig.308



Figure 308

mugo 33
muhlenberghii 63
Muir, John 8
Mutants: Plants or animals with a changed inheritance; sports

N

Nanny Berry 121
Nectarine 83
neglecta 96
negundo 125
nigra 52,57,75,89,94,99,127
nigrum 116
Node: region on stem where lateral leaves and buds are attached 9
Northern Prickley-ash 106
Northern Red Oak 59
Norway Maple 116
Norway Spruce 27
Nyssa 68

O

Oaks 55
oblonga 45
Obtuse 10
occidentalis 20,90,92
octandra 124
Ohio Buckeye 124
opaca 67
orientalis 20
Osage Orange 37
Ostrya 51
ovalis 112
ovata 111
Overcup Oak 65
Ovoid: egg shaped
Ovule 11
Oxydendrum 81

P

Palmate: several veins (a) or leaflets (b) diverging from one point fig.309a and b

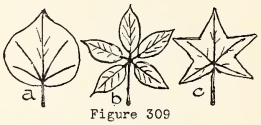


Figure 309

Palmately lobed 10 fig.309c
palustris 61
Panicle: an inflorescence in which the lateral branches rebranch p.11: fig.310



Figure 310

Papaw 42
Paper Mulberry 93
papyrifera 54,93
Paulownia 117
pavia 123
Peach 83
Peachleaf Willow 74
Pear 82
Pecan 110
pecan 110
pennsylvanica 85,127
pennsylvanicum 113
Perfumed Cherry 84
Persea 41
persica 83
Persimmon 44
Petals 10
Petiole: the stem of a leaf
phellos 56
Picea 25
Pignut Hickory 112
Pin Cherry 85
Pines 28
Pin Oak 61
Pinnate: parts arranged as in a feather
Pinnately lobed p.10: fig.311a

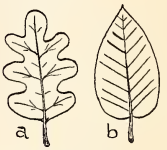


Figure 311

Pinnately veined fig.311b
Pinus 28
Pistil 10
Pistillate: having a pistil; a female flower 10
Pitch Pine 31
Pith: soft tissue at center of a stem
Pith rays 8
platanoides 116
Platanus 90
Poison Sumac 107
Polygamous: bearing both perfect and imperfect flowers
Pome: fleshy fruit of apple type
pomifera 37
ponderosa 29
Ponderosa Pine 29
Poplars 76
populifolia 53
Populus 76
Post Oak 65
Prairie Crabapple 83
prinus 63
profunda 126
Projects 13
prunifolium 122
Pruning; trimming trees or other plants 14
Prunus 84
pseudoacacia 104
pseudo-platanus 115
Pseudotsuga 22
Ptelea 102
Pubescent: covered with hairs

pumila 48,50
Pumpkin Ash 126
pungens 27,34
purpurea 72
Pussy Willow 73
Pyrus 82

Q

quadrangulata 126
Quaking Aspen 77
Quercus 55
Quince 45

R

Raceme: an inflorescence in which short stalked flowers arise at different places from the stem p.11: fig.312



Figure 312

racemosa 47
Red Ash 127
Red Bay 41
Red Buckeye 123
Redbud 91
Red Maple 114
Red Mulberry 93
Red Pine 31
Red Spruce 26
regia 98
resinosa 31
Resinous: having a sticky sap
Rhamnus 81
Rhododendron 42
Rhus 107
rigida 31
River Birch 52
Robinia 104
robur 64
Rock Elm 47
Root system 7
Roughleaf Cornel 120
Rounded: referring to a leaf base 10
rubra 26,58,93
rubrum 114
rufidulum 122
Russian Olive 43

S

saccharinum 114
saccharum 117
Sagittate: leaf shape as pictured p.10: fig.313



Figure 313

Salix 70
Sandbar Willow 70
Sapindus 107
Sapwood 8
Sassafras 43
Scarlet Oak 60
Scientific name 11
Scion: plant part added in grafting
Scotch Pine 32
Scrub Pine 33
Seedlings: very young trees 13
Seeds 7-10
Self-pruning: twigs that break off naturally
Sepals 10
serotina 86
Serrate: having a saw-toothed margin p.10: fig.314



Figure 314

Serviceberry 67
Sessile: without a stem, as leaf flower or fruit fig.315



Figure 315

Shagbark Hickory 111
Shingle Oak 55
Shining Willow 73
Shortleaf Pine 35
Shrubs: woody plants having several stems from the ground 5
Siberian Crabapple 83
sieboldiana 98
Silverbell 68
Silver Maple 114
silvestris 32
Simple: leaves with but one blade
Slash Pine 30
Slippery Elm 46
Small-leaf Linden 95
Small Pignut 112
Smoke Tree 44
Soapberry 107
Solitary: but one at a place
Sorbus 105
Soulangeana 40
Sour Cherry 85
Sourwood 81
Southern Blackhaw 122
Southern Hackberry 92
Southern Red Oak 58
Spatter work 13
Spatulate: somewhat spoon shaped fig.316

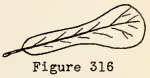


Figure 316

speciosa 118
spicatum 115
Spike: an inflorescence with sessile flowers scattered along a stem p.11: fig.317



Figure 317

spinosa 102
Spruces 25
Staghorn Sumac 108
Stamens: male parts of a flower; producing the pollen 10
Staminate: having stamens; a male flower 10
stellata 65
Stigma: part of the pistil that receives the pollen, see fig.9
Stipular scars: marks left on a stem where stipules were attached
Stipules: Appendages at base of petiole of a leaf fig.318



Figure 318

Stomata: microscopic openings in leaves
Striated: marked with stripes
Striped Maple 113
strobus 28
styraciflua 97
Subglobose: somewhat ball-shaped
Sugar Maple 117
Sumacs 107
Swamp Black Gum 69
Swamp Chestnut Oak 63
Swamp White Oak 62

Date Due

Returned

Swee[illegible]
Sweet[illegible]
Sweet[illegible]
Sweetgum
Swiss Mou[illegible]in Pine 33
Sycamore 90
Sycamore Maple 115
sylvatica 69

T

taeda 30
Tamarack 18
taxifolia 22
Taxodium 19
Terminal bud: at end of twig
texana 60
Texas Red Oak 60
Thuja 20
Tilia 95
tomentosa 117
Tomentose: covered with dense wool-like hairs
Transplanting 14
Tree census 12,15
Tree Of Heaven 101
tremulloides 77
triacanthos 100
trifoliata 102
Trifoliate: with three leaflets fig.319



Figure 319

triloba 42
tripetala 40
Truncate: cut rather squarely p.10: fig.320



Figure 320

Tsuga 24
tulipifera 38
Tuliptree 38

U

Ulmus 46
Umbel: an inflorescence in which the stalked flowers all arise from one place p.11: fig.321



Figure 321

Umbrella Magnolia 40
Uneven: leaves with one side larger than the other p.10: fig.322



Figure 322

V

Veins: Vascular bundles showing as lines on leaves
velutina 59
vernix 107
Viburnum 121
virginiana 21,33,40,44, 46,51,62,87
virginica 119
Viscid: sticky
viscosa 104
vitellina 71

W

Wahoo 121
Walnuts 98
[illegible] 75
[illegible] 109
[illegible] 101
[illegible]ng willow 70
[illegible]ern Soapberry 107
White Ash 128
White Basswood 96
White Fir 23
White Mulberry 94
White Oak 64
White Pine 28
White Poplar 79
White Spruce 26
White Willow 71
Whorled: three or more leaves or stems arising at one node fig.323

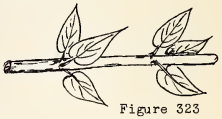


Figure 323

Wild Black Cherry 86
Wild Goose Plum 88
Wild Plum 88
Willow Oak 56
Willows 70
Winged Elm 47
Witches brooms: a fungus growth on trees 92
Witch Hazel 46
Woolly Buckthorn 37

X

Xanthoxylum 106

Y

Yellow Birch 52
Yellow Buckeye 124
Yellow Buckthorn 81
Yellow Willow 71
Yellowwood 103



7-13-56

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